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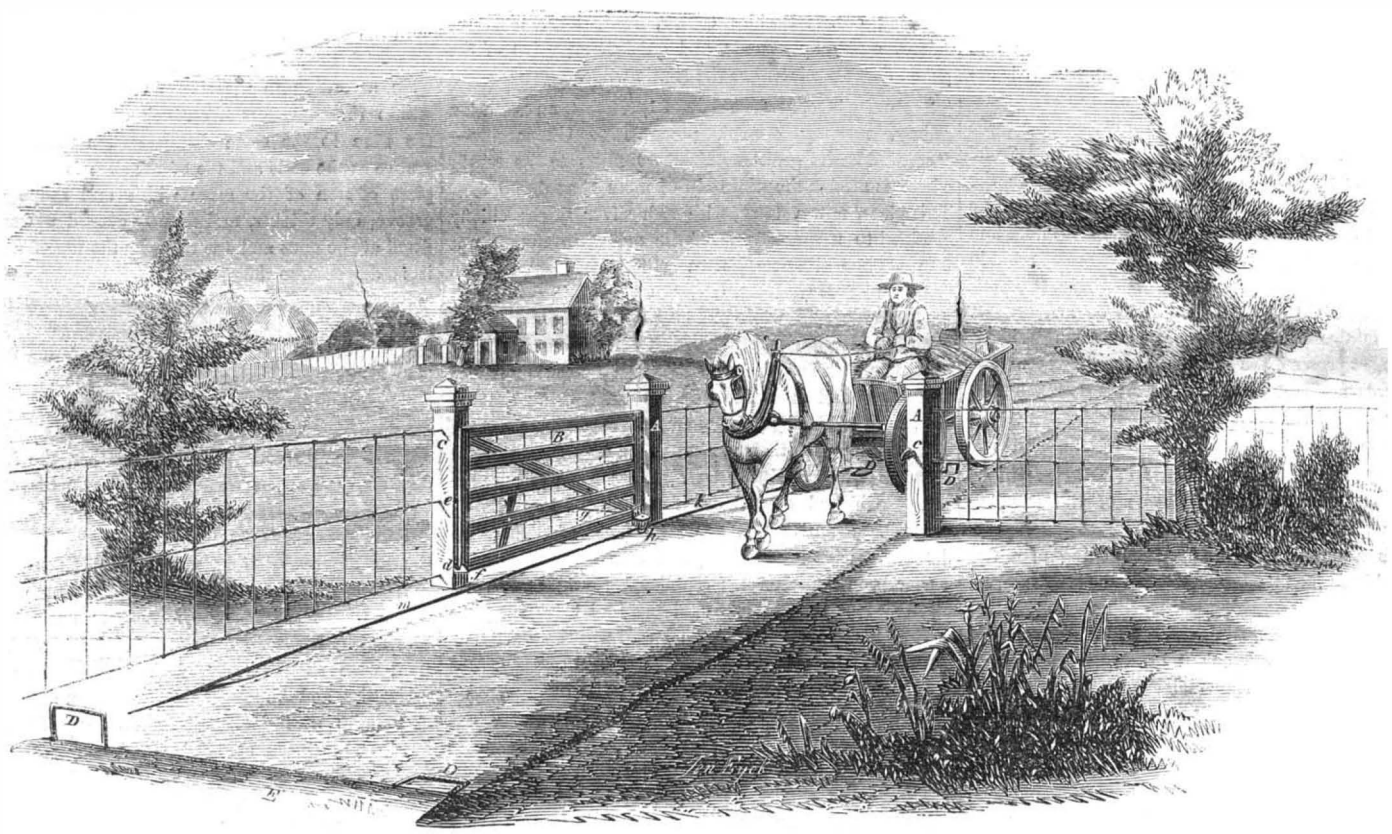
IMPROVED FARM GATE.

We have all of us been astonished in our younger days at that wondrous door in the rock, which, at the words "open sesame" opened without human aid and admitted the captain and his forty thieves into their secluded cavern. There are, however, greater wonders than this, around us and which we can all see ourselves and put in use if we so desire it, namely, gates which open without a spoken word, requiring no enchantment except the touch of the inventor's magic wand. Such a one is the subject of our illustration, and it has the advantage of simplicity, ease of operation, and not likely to be put out of operation by mud or snow. The traveler has not to get into the dirt to open the gate, as at his approach it flies open "like a charm," and closes when the vehicle is through.



HAMILTON'S IMPROVED FARM GATE.

Fig. 1 is a perspective view, and Fig. 2 a diagram of the working parts. The gate B, is hung in the ordinary manner on the posts, A, A, opening against the post C. It is operated by the alternate pulling and pushing of the rods, *k* and *m*, in the following manner. The team approaching the gate finds one crank of the road lever, D, erect, and drives one wheel against it, bearing it down to a horizontal position, and passing entirely over it. This causes that portion of the lever, which projects downwards into the trench, E, to swing backward, pulling the long rod, *m*, which is attached to the latch lever, *h*, that works on a pivot in front of the gate; the other end of the latch lever passes under the gate and pull the latch rod, *c*, drawing the latch, *e*, out of the catch, *c*, and releasing the gate, which the continued pulling of the rod, *m*, swings entirely open, and the lower latch, *d*, fastens on the catch, *f*, holding the gate open while the team passes through. The opening of the gate pulls the rod, *k*, which is attached to the upright crank of the outside road lever, bringing down the upright crank, and erecting the other ready for the wheel to strike after the team comes through the gate; the wheel striking the crank, bears it down, raising up the other crank, which pulls the rod *k*; this swings the latch-lever, *h*, back again, *pushing* the latch-rod, *g*, which vibrates the swivel bar, *p*, pushing the *upper* latch, *e*, forward ready to catch when the gate shuts, and drawing back the *lower* latch, *d*, out of the catch, *f*, releasing the gate from the post, C, and the rod, *k*, still pulling, shuts the gate. When the team passes through the gate, as just described, that is, *going out*, it will be seen that the upper cranks in the engraving are on the left of the team, and are used to operate the gate, which is *pulled* open by the rod, *m*, and *pulled* shut by the rod *k*. In approaching from the other direction, in *going in*, the two lower cranks in the engraving are on the left of the team, and are used to operate the gate, and the gate is *pushed* open by rod *k*, and *pushed* shut by rod *m*,

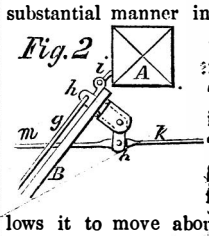


Fig. 2

The gate is any common swing gate; the pivot upon which the latch-lever, *h*, works, should be secured in a substantial manner in front of the gate, at an angle of 45° with the hinge, and distant from it about 15 inches diagonally. The manner of attaching it is not important, provided it is *firm*. The longer arm of latch-lever *h*, passes under the gate, and plays freely in an iron stirrup, which allows it to move about an inch and a half lengthwise of the gate: this works the latches by means of the rod, *g*. The shorter arm of *h*, to which the rods *k*, and *m*, are attached, need not be over 4 inches long, and turned down at the end. The two rods having each an eye through which the end so turned down passes, and a nut below keeps them from falling off. The shorter arm of the lever, *h*, should continue the same diagonal line formed by the pivot and the hinge, 45°, in front of the gate.

This gate has been subjected to a public test and found to operate remarkably well. The inventor is A. J. Hamilton, of Lacon, Marshall county, Ill., who will be happy to give any further information if addressed as above. The patent is dated March 8, 1859.

MECHANICS IN OUR COMMON SCHOOLS.

At the National Convention of Teachers, held in Washington, D. C., on the 11th, a paper was read advocating instruction in mechanism in our common schools. This instruction was recommended to be illustrated by labor-saving devices adapted to the household and the farm, and that sewing and other machines should form the regular apparatus for all school-rooms. It was also recommended that instruction should be given in machinery for workshops and factories. These are apparently very commendable suggestions, and such studies might well take the place of some which now form part of the programme of almost every school. We do not advise, however, a single innovation in our common schools by an increase of studies, as it is well known that they are far too numerous now. Scholars learn a little of everything, and nothing well. It should never be forgotten that schools are designed merely for elementary instruction; the family, workshop and warehouse, for education in the practical arts. Some good works on machinery in school-libraries are desirable, and we would recommend this to our School Commissioners.

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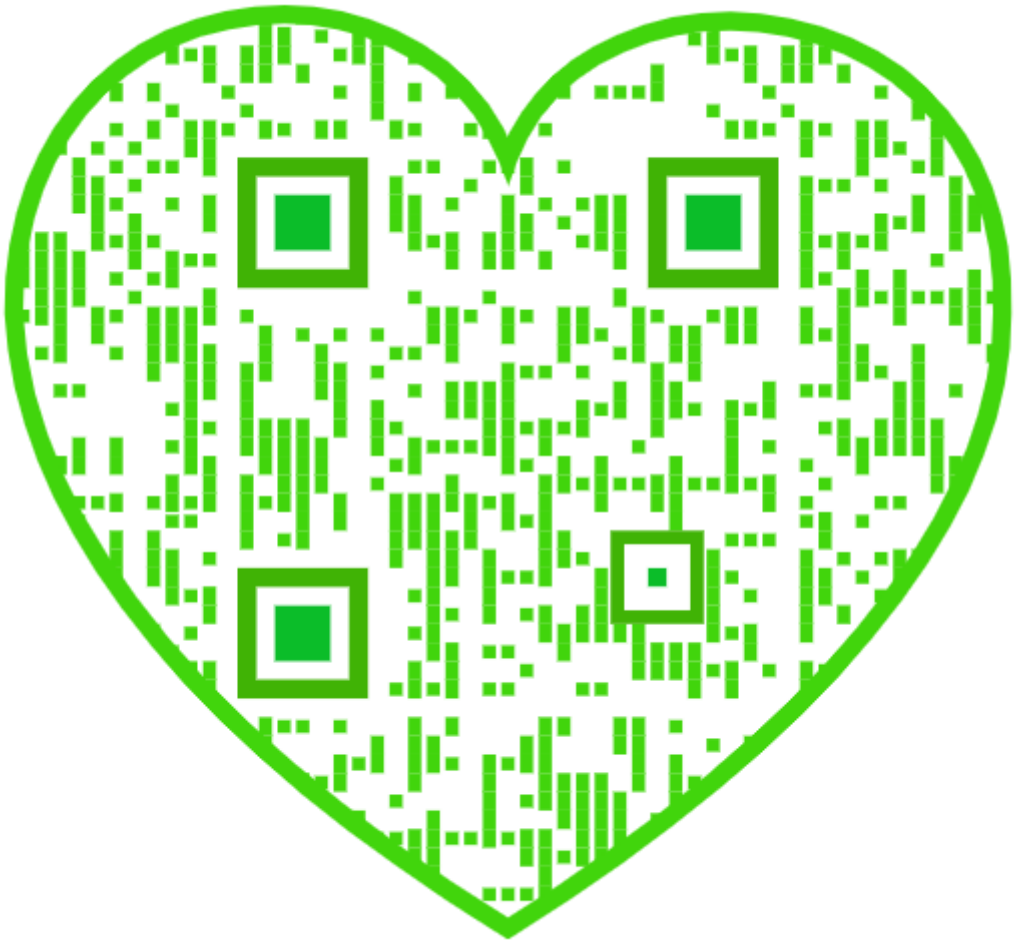

A RAILWAY ON THE MOUNTAIN.

In the last century, Pontoppidan, the bishop of Bergen, published an account of Norway, in which, speaking of the deficiency of the country in roads, he suggested laying them out on the top of the mountains, though it would be a work of difficulty, he admitted, owing to the snow. To readers unacquainted with the region, this seemed a preposterous idea. But the Scandinavian mountains have a contour which goes far to vindicate the bishop from having entertained an extravagant conception. They present no succession of pointed peaks, sharp-backed ridges, steep declivities, deep ravines, and narrow valleys; but, after having risen precipitously on the side of the ocean, their upper surface extends for miles and leagues nearly on a level. Roads might be carried for great distances upon them, without encountering greater difficulties in their level than in the plains of England, the patches of snow over which they would have to pass, even in summer, being the only hindrances. But ordinary highland countries, where the mountains are serrated ridges, presenting yawning gulfs and frowning precipices, have, by engineering skill, been intersected with highways admitting of convenient transit across the Alpine barriers. The loftiest carriage-road in Europe, 9,174 feet, crosses the ridge of Monte Stelvio, one of the Rhætian Alps, a little way down the valley of the Adige, and is a great thoroughfare between the Tyrol and Lombardy.

Railways, at first thought to be only practicable on level lowlands, when their practicability there was admitted, are now rapidly taking possession of the highlands; and the locomotive already snorts, screams, and whistles, at an elevation about equal to that of the highest point of the British Isles. In England, the summit level of the Cromford and High Peak Railway is 1,290 feet; but that of the line between Vienna and Trieste, in the Sœmmering Pass, is 3,000. This is exceeded in Spain by the line from Santander to Reynosa, across the Austrian mountains, partly opened for trafic in 1857, which has two of its stations 3,031 and 3,053 feet above the main tide of the Bay of Biscay. In the United States, the locomotive has not been carried up above 2,700 feet, the summit level of the Baltimore and Ohio railway, in the pass of the Blue Mountains; but in South America, on the Copiapo extension line, it travels at the height of 4,675 feet, which will be increased to 4,479, when two miles further are completed. This is we believe, at present, the highest railway in the world; and deserves notice not merely on that account, but as traversing one of the most extraordinary regions of the globe—a waterless desert teeming with wealth!

Glancing at a good map, the port of Caldera will be perceived on the coast of Chili, one of the stopping places for the Pacific company's steamers. Ten years ago it was a most miserable spot, consisting of a few fishermens' huts upon the beach. But in the brief interval it has become a rapidly rising town, with a good landing wharf and mole, a custom-house, shops, hotels, machine-establishments, and a convenient railway station, which would do honor to the provincial town of any State. From hence, a railway extends to the city of Copiapo, 50 miles inland, where an excellent station greets the traveler. The engineers arrived from England in April, 1850: the first sleepers were laid in the following December, and the line was opened for traffic towards the close of 1851. It traverses a most hopeless waste, where there is no vegetation, not a stream, rill, or spring; and the whole of water required by the engines is carried along with them in tanks, every drop of which is distilled from the sea at Caldera. The entire country is bleached with saltpeter and other salts, lying some depth upon the surface, and forms the southern boundary of the terrible desert of Atacama, which stretches for hundreds of miles to Peru, between the coast and the snow-capped Andes. Formerly, the journey occupied a long day, one of great suffering from the intense heat and suffocating clouds of dust, far surpassing the similar discomforts of the transit between Cairo and Suez. It is now accomplished daily in less than three hours.

The railway was constructed in order to bring the two great mining districts of Chili into easy communication with the coast, facilitate the transport of provisions and water to the establishments, where the price was enormous, with the conveyance of the ores to port. The mines were originally opened for copper, under the superintendence of hardy Cornish miners; and the ores had to be conveyed to the nearest shores by mules, with great difficulty, privation, and cost, to be sent thence round Cape Horn to the smelting-works at Swansea, in Wales. But now silver is the capital product. No localities can well be conceived more arid, verdureless and repelling in appearance, than those which are the richest in subterreanean wealth—sandy wastes, intersected by the most bare, rugged and foreboding-looking mountains. Apart from the rising villages, and a few wretched wanderers hunting after treasure, who frequently perish in the wilderness, there is scarcely a living creature, animal, bird, or insect, except the far-sighted vulture, soaring in mid-air to descry his prey, which so surely and so often sinks with fatigue and thirst in the plains below, or is perched moodily on some adjoining crag, digesting its horrid repast. In unfrequented places, human remains are sometimes found, those of the "cateadores," or mine-hunters, in a wonderful state of preservation, looking like fresh mummies, owing to the dryness of the climate. The bodies of mules are more frequent, some in the most striking positions, having died in the very act of leaning against a rock for support, or while attempting to nibble a last atom from, here and there, a miserable thorn bush. Five years have sometimes passed without a single shower. Hence the cost of water, brought on the backs of donkeys from many leagues distance, has formed a very considerable item in the accounts of the mines, amounting in one instance to not less than $10,000 annually. A nine-gallon cask of brackish water has cost $8; the baiting of a horse or mule, $15; and the sum of $2,000 has been paid for a well of indifferent water 11 feet deep. Yet in these inhospitable regions there are stored incalculable riches, concealed beneath the surface, but in many instances cropping out. Besides copper, lead, iron, bismuth, cobalt, antimony, arsenic, and quicksilver, veins of the purest silver-ore intersect the sterile wilds.

From Copiapo, at the height of 1,200 feet, an extension railray, recently opened, proceeds to Chanareillo—"stunted bush"—distant about 50 miles to the south, where it attains the elevation of more than 4,000 feet. This place, now a town, with rich silver mines, chiefly confined to a spur of one of the mountain ranges, was 30 years ago almost a perfect solitude. It happened on the 18th of May, 1832, that a muleteer, Juan Godoi, reached the spot while hunting a guanaco. Having wounded his game, he pursued it till he was so utterly overcome with fatigue and thirst, that he could advance no further, and sank down on a rock, trusting that on the return of his dogs, their mouths would show that they had come up with their victim. In a very short time he found that he was sitting on a rugged block of pure silver, which had crested out from a vein immediately beneath. From that moment the fame of Chanareillo dates as a rich mining country. Immediately afterwards, a poor peon slept beneath a projecting crag, and in the morning found that his frugal fire had brightened the wall of his resting-place. That wall was the outside of an isolated mass of silver, which, when cut out, yielded 2,800 marks to the fortunate owner; but there were no indications whatever of a vein underneath. But others were discovered, and successfully worked, till the miners came down upon a mass of hard rock, known in the language of the country as a *mesa de piedra*, or "stone table." Here the veins were lost, and it seemed to be the limit of their course. But encouraged by a beautiful old Spanish proverb, *Toda flor tiene su raiz*—"Every flower hath its root," Don Jose Gallo resolved to attempt the passage of the barrier. Shafts were sunk; fathom after fathom was pierced; but the "table" appeared to be of interminable thickness. His means became so utterly exhausted that his wife had to keep a small school, and his sons to take to manual labor in order to provide for their support At last, at the great depth of 266 feet, the barrier was cut through, when vein after vein, band after band, of rich native silver rewarded the adventurer. Other proprietors then imitated his example with the like success. A second extension railroad from Copiapo is contemplated leading northward to Los Tres Puntos, three pointed hights in the center of an equally remarkable mining district, as well as a grand trunk line across the Andes, connecting the shores of the Pacific at Valparaiso with those of the Atlantic at Buenos Ayres.

Mercury boils at 670° Fahrenheit.

SUGGESTION TO AQUARIUM BUILDERS.

MESSRS. EDITORS:—In common with all aqua-vivarium buidlers I have been much annoyed by the rapid growth of *conferæ* on the sunny sides of the tank. Perhaps it would be interesting to many of your readers to learn that by a very simple contrivance I have entirely rid my tanks of these troublesome parasites. My plan is to spread a fine *green* vail over the sides of the tank that are exposed to the sun. I select this color because it allows the passage of more chemical rays of light than any other color. It also forms a very grateful shade for the fish, besides concealing any cloudiness in the water. One of my tanks fitted with this contrivance, has been exposed to the sun for two or three hours a day, for over a month, and I cannot yet detect the slightest trace of *conferoid* growth. Strange to say, this exclusion of light does not seem to interfere with the vegetation of the plants. I am also in the habit of covering the *tops* of my tanks with a *blue* vail. This admits the passage of a large number of chemical rays and thus aids the vegetation of the plants directly beneath.

I would also suggest to aquarium makers that one side of their tanks be constructed of light green glass.

J. C. BARTLETT.

New York, August 29, 1859.

UNDERSHOES FOR HORSES.—Many attempts have been made to shoe horses without the continual driving of nails into the hoof, by which great injury is sometimes inflicted upon valuable horses by nails pricking the quick. In order to diminish this evil, one of our London exchanges states that George Thomas, of that city, has invented a double-bottomed shoe, which is constructed and applied as follows:—"He takes an ordinary horse-shoe, and forms a groove in the part which comes in contact with the ground. This groove is about a quarter or three-eighths of an inch deep, and half an inch or more wide, according to the size of the horse and shoe, and within three-quarters of an inch from one extremity of the shoe to the same distance from the other. The groove at the ends and toe of the shoe is cut under. A piece of iron of the same width and shape with the groove, only thicker, and slightly curved upwards, is so fitted at the ends and toe that, by the tap of a hammer, it is driven into the groove, and hence into the under cutting. The junction forms a complete dovetail, which prevents the removal of the inner shoe unless by the forcible aid of a chisel. The advantage of this inner shoe is that it is made to project beyond the ordinary shoe, and, when worn down, can easily be removed and replaced by another, without pulling off the shoe from the horse's hoof. Besides, in frosty weather, the inner shoe needs only to be jagged, and you have the horse frosted."

EXPERIMENTS WITH CANNONS.—A correspondent of the Baltimore *American*, writing from Old Point Comfort, gives an interesting account of gunning experiments which were recently made there before a board of officers at the head of which is Captain Dyer. The guns tried were rifled cannon, with flanged and expanding projectiles, and the ranges that have been determined are as follows: at 10° elevation a distance of 3,400 yards has been attained; at 13½°, 4,200 yards; at 31° 6,100 yards. The ranges obtained from a 24-pounder gun, with 5½ pounds of powder, and hells weighing 45 pounds, at 10° and 13½° elevation, respectively, are about equal to those heretofore obtained from a ten-inch columbian (128-pounder) with 18 pounds of powder at 15° and 20° elevation.

THE CHAMELEON SHOE.—The fashion of decorating ladies' slippers either by needle work, by figured patterns on the leather, or other material, or by the insertion of colored silk or satin, old as it is, has just been improved upon. Mr. Leprince, of Regent-street, London, has contrived a method of changing the pieces of colored satin as long as the wearer desires, without in any way injuring the slipper. He makes a little pocket in the upper part of the slipper, under the perforations of the pattern, into which is placed the piece of silk to be worn. When the wearer wishes to change the color, nothing is easier than to withdraw one piece and insert another. A dozen pieces of satin on stiff linings, of various shades and colors are sold with the slippers. Tasteful bows and ribbons with buckles may also be attached to the shoes by a simple contrivance, and as easily removed. The novelty has for its name the "chameleon shoe."

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AMERICAN REAPERS IN EUROPE.

A great trial of reaping and mowing machines recently took place at one of the royal farms in France, and the Emperor awarded the prizes in person, which were chiefly won by American machines. The French authorities had formed two distinct classes of competition—reaping and mowing—with three prizes for each class; and also a gold medal of honor for the best machine on the ground. The first prize was a gold medal and 1,000 francs; the second a silver medal and 500 francs, and the third a bronze medal and 300 francs. Twenty-five reapers appeared on the field as candidates for the honors and awards, and half an acre of heavy wheat, was set off for each. The test of superiority was cutting the wheat cleanest and in the least space of time. After a very few turns in the field, the contest lay between Burgess and Key's (Allen's Patent) and Wood's (stated to be Manny's Patent) reapers, in which the former took the lead and was unanimously awarded the first prize, the latter the second. The mowers were then set to work on a field of light grass, and in this contest one of Burgess & Key's machines took the first prize also; their reaper being granted at the same time the gold medal of honor likewise. Most of the machines on the ground were built in France. It has been stated that, although the reaper which gained the chief prizes is built upon the principle of Allen's patent, it was constructed in England. Whether this is so or not, we are not able to tell at present.

On the 27th of July the Royal Agricultural Society of Ireland held its annual exhibition at Dundalk. The trial of harvesters is described as follows by the correspondent of an able exchange, *The Irish Agricultural Review*:—"The machines that entered the list were Burgess & Key's (Allen's patent) and Wood's (Manny's patent) combined mower-and-reaper; both of American invention. It took about three minutes and a half to put Burgess & Key's into working gear in the field. I was unable to measure the time occupied in putting the other in order. Wood's machine was directed by Mr. Cranston, the London agent, who was assisted by two efficient and practiced Yankee men; Burgess & Key's was directed by Mr. O'Neill, of Athy, and worked by a man especially sent over for the purpose. When Mr. Cranston mounted the platform of his machine, and one of his assistants perched himself in the driving seat, intense excitement prevailed. The mower was instantly at full work, crossing through the very heart of an uneven piece of light old meadow; the work was pronounced good. The horses yoked to Burgess & Key's machine would not move a pace after hearing the sound of its quickly oscillating knife-blades; but fortunately, a more manageable pair was immediately procured, and soon the compact little mower was in the midst of a piece of trampled grass, which it cut better than any one expected. 'That,' exclaimed a farmer who stood beside me, 'is the d—l's invention.' Each machine cut about 4 feet 6 inches clear. Woods' mowed well; but Burgess & Key's cut lower and cleaner. My opinion of the relative merits of the two machines may be put briefly thus:—As a mower, Wood's machine is not in its present construction capable of cutting as low or clean as the other; Burgess & Key's machine does not enable the farmer to vary the height from the ground at which to mow, which I consider a great disadvantage; but it seems to me that a roller, small wheel, or sole, could be put under the extreme end of the arm for obviating this evil. The cutting apparatus varies a little. The width of the knives and the angle of the cutting edge is greater in Wood's machine. If I have been able to calculate correctly, the knives in Wood's machine do not oscillate as quickly as the other, which would account for its (to me) apparent inferiority in cutting laid grass. It has, however, the great advantage of being a second if not a first-rate reaper. It is but fair that I should mention that Mr. Tate, of the royal farm at Windsor, informed me, on the occasion of a late visit to that place that he has mowed 122 acres this season with Wood's machine, without the expenditure of a penny for repairs."

A PROFESSOR ON BROADCLOTH.

Professor Hamilton, in an address on hygeine to the graduates of the Buffalo Medical College, denounced broadcloth as an enemy to exercise and health, but did not suggest a substitute. He says: "American gentlemen have adopted as a national costume, broadcloth—a thin, tight-fitting black suit of broadcloth. To foreigners, we seem always in mourning: we travel in black, we write in black, we work in black. The priest, the lawyer, the doctor, the literary man, the mechanic, and even the day-laborer, choose always the same unvarying, monotonous black broadcloth; a style and material which never ought to have been adopted out of the drawing-room or the pulpit; because it is a feeble and expensive fabric; because it is at the North no suitable protection against the cold, nor is it indeed any more suitable at the South. It is too thin to be warm in the winter, and too black to be cool in the summer, but especially do we object to it because the wearer is always afraid of soiling it by exposure. Young gentlemen will not play ball, or pitch quoits, or wrestle and tumble, or any other similar thing, lest their broadcloth should be rended. They will not go out into the storm, because the broadcloth will lose its luster if rain falls upon it; they will not run because they have no confidence in the strength of the broadcloth; they dare not mount a horse, or leap a fence, because broadcloth as everybody knows is so faithless. So these young men and these older men, merchants, mechanics, and all, learn to walk, talk, and think soberly and carefully; they seldom venture to laugh to the full extent of their sides."

HOW TO LIVE LONG.

More people die annually from a want of sufficient brain-work than from an excess of it. Good health of body and mind depends on each having its full share of exercise and work, and it would seem from history that we can better afford the body to be in a state of lassitude than allow the intellectual powers to lie dormant. There may be a physical cause for this, from the fact that much thought induces a temperate life; but the exceptions to such a rule would be found so enormous as to show that it was not the only secret. We are rather inclined to think that the most general rule and the one capable of the broadest application, by which to attain to that great desideratum, "a green old age," is to give the mind full play—to expand the powers of thought by reading and observation, and to banish the fear of death, resulting from an exhausted "knowledge-box." We have shown to what ages the old philosophers lived, and many modern ones have been equally long-lived. Galileo and Roger Bacon both lived to 78, Buffon died at 81, Goethe and West were 82, Franklin and Herschel lived to 84, and Newton and Voltaire did not finish their labors until 85. The astronomer Halley was 86 at his decease, and Sir Hans Soane was 93. Michel Angelo and Titian, the great masters of art, lived to 96. These, surely, are instances enough to stimulate the individual who wishes to live long, not to forget to cultivate the intellectual faculties and imagination, while he is attending to the physical aids of exercise, cleanliness and temperance. We all think too much of the body and neglect the higher and diviner part within us; we cleanse the temple and adorn its pillars, but we forget that the dweller therein also requires attention and care.

REMEDY FOR INSECT BITES.

When a mosquito, flea, gnat, or other noxious insect punctures the human skin, it deposits or injects an atom of an acidulous fluid of a poisonous nature. The results are irration, a sensation of tickling, itching, or of pain. The tickling of flies we are comparatively indifferent about; but the itch produced by a flea, or gnat, or other noisome insect, disturbs our serenity, and, like the pain of a wasp or a bee sting, excites us to a remedy. The best remedies for the sting of insects are those which will instantly neutralize this acidulous poison deposited in the skin. These are either ammonia or borax. The alkaline re-action of borax is scarcely yet sufficiently appreciated. However, a time will come when its good qualities will be known, and more universally valued than ammonia, or as it is commonly termed "hartshorn;" it is moreover a salt of that innocent nature, that it may be kept in every household. The solution of borax for insect bites is made thus:—Dissolve one ounce of borax in one pint of water that has been boiled and allowed to cool. Instead of plain water, distilled rose water, elder, or orange flower water is more pleasant. The bites are to be dabbed with the solution so long as there is any irration. For bees' or wasps' stings, the borax solution may be made of twice the above strength. In every farmhouse this solution should be kept as a household remedy.—*S. Passe.*

To Make Blackberry Wine.—The following is a recipe which was given at a late meeting of the Farmer's Club, in this city, by Mr. R. G. Peardee:—"Add three pounds of refined sugar to each half gallon of the pure juice and one quart of water, and let it ferment and work off freely at the bung-hole. Care must be taken to keep the cask full. I would not recommend adding over fifty per cent of water to the juice of any fruit to make wine. The great fault is over-watering. Some grapes will make wine without sugar, but there are but few that will answer. Use more juice and less water, and give your wine age. Don't sweeten your must until you make sirup when your intention is to make wine. I have lately tasted wine made of blackberries that was equal almost to the very best imported grape wine; it was well worked in a barrel by keeping it constantly filled up, so that all the froth and matter rising with it would go over until fermentation ceased, and then bunged tight, and stood till a convenient time in winter or spring to draw off and bottle. It must be corked tight, sealed, and laid down till two years old, when it becomes a truly excellent wine." The Lawton blackberry is now cultivated extensively in various farms for the New York markets. About three hundred bushels, it is said, can be raised from one acre. Each berry is about twice the size of the common sort, and is far more rich in flavor.

Value of the Earth-worm.—The common earth-worm, though apt to be despised and trodden on, is really a useful creature in its way. Mr. Knapp describes it as the natural manurer of the soil, consuming on the surface the softer part of decayed vegetable matters, and conveying downwards the more woody fibers, which there molder and fertilize. They perforate the earth in all directions, thus rendering it permeable by air and water, both indispensable to vegetable life. According to Mr. Darwin's mode of expression, they give a kind of under tillage to the land, performing the same below ground that the spade does above for the garden, and the plow for arable soil. It is, in consequence, chiefly of the natural operations of worms that fields which have been overspread with lime, burnt marl, or cinders, become, in process of time, covered by a finely-divided soil, fitted for the support of vegetation. This result, though usually attributed by farmers to the "working down" of these materials, is really due to the action of earth-worms, as may be seen in the innumerable *casts* of which the initial soil consists. These are obviously produced by the digestive proceedings of the worms, which take into their intestinal canal a large quantity of the soil in which they feed and burrow, and then reject in the form of the so-called casts. "In this manner," says Mr. Darwin, "a field manured with marl has been covered, in the course of 80 years, with a bed of earth averaging 13 inches in thickness."—*Encyclopædia Britannica.*

An Artesian Well.—We learn from an exchange that they have an artesian well at Louisville, Ky., which is 2,086 feet in depth. Three years were occupied in boring it. It is piped for only 90 feet, and the water pours forth at a rate of 230 gallons per minute. It rises in pipes 170 feet above the surface, and has a temperature of 76½° Fah. It is perfectly limped on issuing forth, and has a specific gravity of 1.013, furnishing, according to analysis, the gases, sulphurated hydrogen, carbonic acid, and nitrogen, containing most of the chlorides, sulphates, bicarbonates, and phosphates, with iodine and bromid magnesium. The taste is a combination of salt and sulphur. By touching some of the screws about the machinery, it throws a stream of water 120 feet above the pipe. A deep well and a tall throw, this Louisville well! We should like to see it.

Virginia Mechanics' Institute.—The sixth annual exhibition of the above institute will open in Richmond, Va., on the 19th of October next. Northern manufacturers and mechanics will do well to bear this exhibition in mind, as there is a wide market in Virginia for many articles of handicraft which are not produced in that State. Information and circulars can be procured of Wm. Forbes, chairman, Richmond, Va.

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INTERESTING PHOTOGRAPHIC EXPERIMENTS.

The following account of experiments conducted by Niepce de St. Victor, of Paris, possesses great interest to men of science:—

If, upon a metal plate heated in contact with boiling water, we place first an engraving on a printed paper, then a sheet of paper impregnated first with nitrate of silver and afterwards with chloride of gold, we obtain a violet blue image of the blacks of the engraving or of the printed letters. If the paper is only impregnated with nitrate of silver, the whites only of the engraving are reproduced in a bistre color.

A metal tube heated to the temperature of 212° Fah, the opening of which covers the engraving placed upon the sensitized paper, produces the same effect as the warm plate.

With paper prepared with the salts of silver and gold, and with the plate warmed with boiling water, large printed characters are reproduced at a distance of several *millimeters';** but the image is not produced if we interpose a thin plate of mica, metal, or even a piece of *papier vegetal.*

If we place a paper printed with large letters between two glass plates, and warm the whole to a temperature sufficient to slightly scorch the paper, upon removing the paper we perceive the letters have left their imprint upon the glass. If upon this imprint we place a sheet of paper prepared with the salts of silver and gold, and warm the whole upon a metal plate, heated with boiling water, we obtain a new image, as if the sensitive paper had been placed upon the printed characters themselves.

Designs traced with writing ink, black lead or charcoal are not reproduced when they are traced upon ordinary paper, but they are produced upon *papier vegetal.*

An unvarnished positive photographic image upon collodioned glass, formed by reduced iodide of silver, has printed upon sensitized paper, under the influence of heat, many consecutive images of the "darks;" the last proofs being the sharpest and most vigorous.

Some tiles and porcelain plates (glazed) with black letters or painted in various colors, and passed through the furnace without being enameled, gave impressions; but letters and designs covered with enamel gave none.

Tissues shaded with black and white, or with varied colors, impressed their images upon sensitized paper; but the images were very variable. In general the blacks printed the best, but frequently the whites also; the image of every color has a character and intensity peculiar to itself, the variations observed depending doubtless upon the nature of the color. The colors produced by the same coloring matter, applied with different mordants in succession, were printed very unequally and very differently. Madder, for example, which gives upon cotton a red with alumina; violet, with a salt of iron, a deep brown or a red brown, according to the relative proportions of alum and iron; the red was printed stronger than the other hues upon paper prepared with chloride of gold. In the case of whites obtained upon colored grounds by means of a discharge, the whites as well as the grounds left their images upon the sensitive paper; upon cotton dyed with indigo blue, the blue ground is reproduced, but the whites are not; while in those dyed with Prussian blue, it is, on the contrary, the whites that are reproduced. If we spread upon paper or porcelain separate bands of indigo and Prussian blue, only the bands of indigo will be reproduced, never the Prussian blue. Another fact proves the preponderating influence of the peculiar nature of each color and ink. I have seen two engravings of the same drawing, but printed with different inks; one gave a positive, the other a negative image upon paper sensitized with chloride of gold.

I shall conclude with some remarks upon the preparation and use of sensitive papers in thermography.

Prepare two solutions, one of fused nitrate of silver of the strength of one per cent, the other of chloride of gold of the same strength. The paper sensitized with nitrate of silver only is obtained in the ordinary way. To prepare the paper with both salts of silver and of gold, float upon the solution of nitrate of silver a piece of Berzelius's paper, holding it by one corner; dry it slowly without scorching, before a fire, and when dry, pass it through the solution of chloride of gold, floating the same side that was placed on the silver solution; dry it again without the temperature attaining that of boiling water, because at this temperature the paper becomes discolored.

To obtain an image, place an engraving with its back upon the plate, warmed by boiling water, and lay the sensitized paper upon the engraved side, and cover it with a plate of glass of several millimeters in thickness; upon looking through this glass we see the image appear in a few minutes. The image is clearest when the paper is very dry and not over sensitive; if it does not become sufficiently distinct, it may be strengthened by exposing the sheet of paper to the heat of a clear fire. If it be very vigorous, and stands out clearly from a ground slightly colored, it may be fixed by treating it with a solution of hyposulphite of soda, which removes those portions of the salts of silver and gold which have not been reduced by heat. The paper sensitized with the double salt of silver and gold will not keep in the dark; it must be prepared as wanted, and used immediately. Paper impregnated with a solution of nitric acid of a strength of one per cent, or with a solution of potassium of ten per cent, is sufficiently sensitive to yield thermographic images, but only at a temperature much above 212° Fah.

I attempted to obtain images in the focus of a lens which concentrated the rays emanating from a heated object, but the result was always negative. I have not yet ascertained if the images formed in the focus of a concave mirror are more active. At present it appears to be an indispensable condition of success, under certain circumstances, that the radiation be direct without the interposition of a screen.

The action that produces the thermographic image is, doubtless, a very complex one. Calorific radiations play an important part, but the solid vapors emanating from the heated object may also intervene.

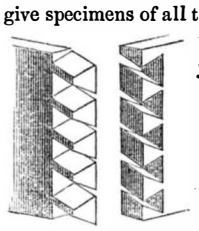
But in the case, at least, of the medals and a dry stamp which were reproduced, notwithstanding the interposition of a thin continuous plate of mica, silver or copper, provided the pressure was sufficiently strong and the temperature high enough, it must be understood that the action of heat preponderates; and it appears to me established that a high temperature produces, under certain circumstances, facts analogous to those we see produced daily by light, such as the fading of colors, the reduction of the salts of gold, silver, &c.

Luminous and calorific action may sometimes coalesce or unite to produce simultaneously the same effect, but they are often separate and distinct, as proved by the experiments of MM. Bouillon and Sauvage.

* A millimeter is equal to ·03937 of an English inch.

DOVETAIL AND TENON CUTTER.

In describing McDonald's machine for this purpose in our last number, we had not room upon the engraving to give specimens of all the work it is capable of doing, and



we now show an angle or locked joint which can be cut by this machine, and which the inventor regards as of more importance than the others. The cutter marked *d*, Fig. 2, in our last illustration, should have cutting teeth shown upon the face of the screw, and the inventor states that his machine will cut one thousand dovetails every minute with ease. If this statement be correct his machines should not get rusty for want of use.

DELAYS AT THE PATENT OFFICE.

Nearly every mail brings to us letters of inquiry as to the present condition of the Patent Office, such as: "Why is the Office so far behind in its examinations?" or "When will A B's case come up for examination?" or "Is it not almost time for my case to be decided upon at the Patent Office?" and other equally pertinent questions of our clients from all parts of the country. We append an extract from the letter of an inventor for whom we have acted as attorneys in procuring several patents. It is a fair specimen of the letters we are daily receiving:—

"I am very sorry that the Office consumes so much time before issuing patents. If there is any way of remedying the evil, it should be done. In my case, the delay has operated much against my interest, inasmuch as I expected the Letters Patent to issue in eight weeks at most, and made some arrangements with other parties, whom I told to look for the issue at any time six weeks from date of application. Of course, nothing can be done until we are sure of the patent, and every week's delay causes additional expense. I hope before long to see the business of the Office moving on with its former activity. H. K. S."

It is very annoying to solicitors of patents, as well as to inventors, to have the examination of their cases so long delayed in the Patent Office as some classes of cases have been during the past 12 months, and we trust more vigor and industry will be hereafter manifested. We do not desire to complain of laxness in every department of the Office; but in some of the examining-rooms there is a manifest inefficiency or inertness which does not well comport with the active spirit manifested by inventors throughout the United States; and we trust our worthy Commissioner of Patents will see that the *back work* of the Office is brought up immediately, and hereafter kept up, as we are satisfied the present examining-corps is ample if the labor of the Office is properly distributed, and if each examiner will do his whole duty.

Let us not, we beseech you, Mr. Commissioner, be obliged to call your attention to this matter again.

THE LAST WORD TO FOUR THOUSAND READERS!

The present number of the SCIENTIFIC AMERICAN terminates the subscriptions of about 4,000 subscribers, and the paper will therefore be discontinued after this date to all who have not renewed. We entertain no fear in reference to this large list of readers; we are confident that they will all return their own subscriptions promptly, and we are also fully assured that, among this number, are many of the warmest and staunchest supporters of the paper—friends who esteem it a privilege to recommend it on all proper occasions, and to spend a little of their spare time in inducing others to join them in the formation of clubs. Our readers are well aware that we employ no traveling agents to solicit subscriptions; and this is the principal reason why we so often appeal to them to aid our circulation. We intend, as heretofore, to publish a journal of substantial character and value—one which shall, in some degree, illustrate the amazing progress of our people in material things—a journal that shall reflect the genius of not only our own people, but also, in a measure, the genius of the whole world. With the unparalled facilities at our command for gathering from the Inventor, Mechanic and Manufacturer a knowledge of the latest and best improvements in the arts, and the ease with which we are able to collate and translate from our English, French and German exchanges, we disseminate more valuable information than any other journal now published in this country. Unquestionably, the SCIENTIFIC AMERICAN is the most extensively circulated, and has the best reputation, of any similar publication ever undertaken here. We are able to command the very best means to make our journal surpass all others, and we shall bend our entire energies to render it more and more worthy of public confidence and support. Out readers should distinctly bear in mind that the editorial management of the paper is entrusted to special hands, and receives the attention and mental ability of editors who are well qualified from experience to direct and control its columns—*who have opinions of their own, and are not afraid to avow them.*

Friends! send in your subscriptions without delay, and induce your neighbors to join with you. We wish also to call attention especially to the quality of the mechanical engravings which illustrate our columns. This feature receives much care and attention. They are not mere second-hand stuff, whittled out by a jack-knife, but are designed and executed by our own artist, and under our own supervision.

COST OF RUNNING LOCOMOTIVES.—We have received a pamphlet detailing the cost of running locomotives on the Baltimore and Ohio Railroad, for the month of July, and we find that the cost of their coal-burning locomotives varies, on passenger-engines, from $5·60 per 100 miles run, to $20·30, and the number of miles run by such engines during the month has varied from 1,395 to 3,034 per engine. The tunnage engines have cost from $11·70 per 100 miles to $21·50, and the number of miles run by each engine has varied from 624 to 2,024. The pounds of coal consumed per mile has varied in passenger-engines from 10·7 to 62 (coal and coke mixed), and in tunnage-engines from 28·2 to 88·9. These are the average of 209 engines, and so constitute fair averages. The cost of coal at Wheeling, Va., is $3 per tun.

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COMMUNICATIONS BETWEEN RAILWAY PASSENGERS AND DRIVERS.

Mr. C. Batty, of Manchester, England, has gazetted a patent which appears to be at once simple, inexpensive of application, and efficacious. It has, besides, the merit of being unobjectionable to railway directors, who have justly feared placing too much power in the hands of passengers, lest it might lead to a greater evil than that sought to be remedied. Mr. Batty's invention is to place in the weather-board, on each side of the engine and driver, a mirror or looking-glass, in which the whole of each side of the train will be reflected, and which of course will be accessible to either driver or stoker. Many engines have at present a weather-board, in which is inserted a piece of plain glass, through which the driver and stoker can look ahead with protection from the weather; and in such cases this mirror would be placed outside this plain glass, flush with the footboards of the carriages. All the railway directors and officials who have yet seen the invention applied, appear to have been struck by its admirable adaptation to the requirements of the service by day, and this alone, considering how many accidents occur by day, should be sufficient to secure its adoption extensively. The inventor, however, has provided for its application by night. He accomplishes this by attaching a lamp on each side of the last carriage of a train, and the reflection of the lamp in the mirror readily exhibits any irregularity in the train that may occur after darkness has set in, whilst the hand or handkerchief of the guard or a passenger put out of a window between the light and the mirror is reflected in the latter as clearly as by day. A great advantage of this invention is that it does not, like some previous ones, get deranged upon curves, and it is easy to see that a series of signals might be used by the guard, so that he could communicate with the driver without the train being stopped. In the case of a train getting on fire, that greatest of all evils dreaded by passengers, the driver or stoker must be almost certain to see the smoke or flame reflected in the mirror, and put in a position to stop the train. Mr. Batty proposes colored lamps and flags in the hands of the guards as a means of communicating with the drivers—the former by night and the latter by day.—*Exchange.*

IRON HOOPS FOR BALING COTTON.

A correspondent of the Providence *Journal* writes as follows on the advantages of iron hoops as substitutes for ropes in baling cotton:—

"Under the present management, where bales are bound with rope, and no allowance is made for tare, the purchaser is compelled to pay for some nine pounds of rope to each bale, which is worth to him but two cents per pound; so that the manufacturer who buys his cotton at 13 cents per pound suffers a loss of about one dollar on each bale that he buys; while the planter, who bought the rope at 10 cents per pound, makes a profit out of its sale of 27 cents on each bale of his cotton. Now, with the best inventions for fastening, the iron bands can be furnished weighing but six pounds to the bale, and costing but 50 cents, thus leaving to the planter a still larger profit on its sale than in the case of rope, while the purchaser will have to pay for but six pounds of banding instead of nine, as before; thus effecting a saving of more than 20 cents on each bale, even allowing the iron to be worthless to him after its removal. But such would not be the case, as the iron bands, even though a little rusted, could be applied to many useful purposes, such as hooping pails, tubs and other woodenware, or in baling the coarser descriptions of manufactured goods. This calculation is based on a grade of iron which, while it is suitable for the above purposes, possesses 50 per cent. more strength than the ropes commonly used in binding cotton, and which, to say the least, would be worth quite as much as the waste rope. So that, in reality, when this kind of banding is used, the purchaser would have less reason to claim an allowance for tare than when rope is used. In addition to this, as the iron binding does not stretch like ropes, the bales are much more compact, the cost of freight should be proportionately diminished, and there would be less waste by handling and transportation, as the bales cannot be torn open without great effort. And, again, the risk of loss or damage by fire would be considerably less, as cotton will not burn as long as it can be kept closely compacted."

NEW YORK WATER.

The unpleasant taste and odor of our Croton water still continues, but the health of the city does not seem to be the least affected by it, in fact, this is perhaps the most heathly summer ever experienced in it. An analysis of the fœtid water, together with opinions on the subject, has been published by Professors Boeck and Adelberg, of New York. Their chemical investigation was made with water taken from the lower reservoir; they state, that they found the water charged with organic matter in a state of chemical transformation, yielding geic and humic acids, in combination with alkalies. They also found sulphurated hydrogen gas, and some iron and alumina.

Their views as to the causes which produced this state of the water are rather funny. As far as we can understand them, it required a dead horse, or some other decaying animal, near the Croton Lake, to mix with the vegetable matter in the water to produce incipient fermentation. This is an entirely erroneous view of the question. Decomposition of a like character can be produced without decaying animal matter, as vegetables contain azote (which is necessary to cause decomposition), as well as animals. Let the Water Commissioners run out the reservoirs clean from the bottoms, so as to carry off all the heavy deposited organic matter, and the infamous taste of the water will quickly disappear.

ARSENIOUS GREEN PAPER

Messrs. Editors:—You have frequently spoken of the bad effects resulting from the green colors of paper hangings containing arsenic. Those evils can be prevented by simply coating the paper with a white transparent varnish, which can be done by any practical house-painter or paper-hanger. By so doing the poison is hermetically sealed, consequently the air, &c., cannot act upon it; neither will washing injure it.

James Quarterman.

New York, Aug. 27, 1859.

Treatment of Gunpowder Burns.—When a charge of powder is fired near an exposed part of the body, a portion of the unburnt powder is deposited in the skin, proportionably to the imperfection of the combustion and the coarseness of the granules. The inflammation which results is not sufficient to procure the elimination of the grains, and the person remains tatooed for life. Hitherto the only means for preventing such a deformity has consisted in the picking out by the fine point of a knife or needle each separate granule. This, although a very tedious and painful process,, answers well enough in burns of a limited size; but in a recent case in which the whole side of the face was completely blackened, Professor Busch resolved to try a plan he had seen Hebra adopt for the removal of freckles, viz: exciting an eczematous inflammation by means of a solution of five grains of corrosive sublimate to eight ounces of water. This was kept applied during several hours, for five days, with the effect of exciting a smart eczema, and detaching the granules. The burn was quite recent, and whether the means used is applicable to burns of an older date remains to be tried.

Gilding on Glass.—Dissolve in boiled linseed oil an equal weight of copal or amber, and add as much oil of turpentine as will enable you to apply the compound or size thus formed, as thin as possible to the parts of glass intended to be gilt. The glass is to be placed in a stove, till it is so warm as almost to burn the fingers when handled. At this temperature the size becomes adhesive, and a piece of leaf gold applied in the usual way, will immediately stick. Sweep off the superfluous portions of the leaf; and when quite cold it may be burnished, taking care to interpose a piece of india paper between the gold and the burnisher. It sometime happens, when the varnish is not very good, that by repeated washing, the gold wears off; on this account the practice of burning it in is usually had recourse to. For this purpose, some gold powder is ground with borax, and in this state applied to the clean surface of the glass by a camel's-hair pencil; when quite dry the glass is put into a stove heated to about the temperature of an annealing oven; the gold burns off, and the borax, by vitrifying, cements the gold with great firmness to the glass; after which it may be burnished.

A New Source of Ammonia.—Mr. Alexander Williams, of Neath, England, in a letter to the *Journal of the Society of Arts*, has suggested a means of economizing the waste nitrogen products escaping from the oil of vitriol chamber, by effecting their conversion into ammonia. This is done by passing the escaping gases, mixed with steam, over heated charcoal, and then into dilute sulphuric acid, by which sulphate of ammonia is obtained. The following is Mr. Williams' description of the arrangement he employs, and which has been tried on a large scale at the Pontardawe Vitriol Works:—

"The apparatus fitted up was of the following description: A furnace was built above the exit-tube of one of their vitriol chambers, and a brick gas-retort, about 14 inches in diameter, 8 feet long, and open at both ends, was passed through its whole length. This retort was filled with charcoal, and kept at a red heat; the exit-tube of the chamber and a steam-jet to supply the hydrogen were attached to one end, whilst at the other end was an upright leaden cylinder filled with coke, and moistened with diluted sulphuric acid. On passing the waste gases and steam through the retort containing hot charcoal, both were decomposed, the oxygen of each uniting with the charcoal to form carbonic acid, the nitrogen and hydrogen combining to form ammonia; then, together, probably forming carbonate of ammonia, which was again decomposed by the diluted sulphuric acid, the sulphate of ammonia being found remaining in solution. This solution was then evaporated, and, in July, 1857, I first had the pleasure of obtaining any quantity of crystals of sulphate of ammonia, by this process, from a vitriol chamber in actual work."

Trial of Steam Fire-engines.—The steam fire-engine built for Lee & Larned, of this city, at the Novelty Works, was recently tried in Philadelphia, and found to be an excellent "machine." She drew water from one of the large Birkenbine plugs, and forced it through 50 feet of hose. With 145 pounds of steam, she played two streams at once, through $\frac{7}{8}$ nozzles, 189 feet 9 inches each. She then played, respectively, one stream through 1 inch nozzle, 231 feet; $1\frac{3}{8}$ do., 228; and $1\frac{1}{4}$ do., 227 feet. At these throws she was run with about 150 pounds of steam, as indicated by the gage. The measurements were made by a committee of Philadelphia firemen, namely, Tobias Huber, of the Philadelphia Hose; H. A. Cook, Hibernia Engine, and Mr. Rudolph, of Schuylkill Hose. The weight of the machine is about 5,000 pounds. It generates steam rapidly, having 225 square inches of fire-surface in the boiler. It has a cylinder of nine inches diameter, with a powerful and quick stroke of $8\frac{1}{2}$ inches, making over 200 revolutions per minute.

Lightning-rods.—As we have inquiries almost every week about putting up lightning-rods, we will therefore give a general answer to all who are in pursuit of such information. In putting up a rod, care must be observed to have all the joints perfectly connected; for it has frequently happened that the lightning has passed from ill-jointed rods into buildings. The rod should be clamped to the building with brackets of varnished dry wood or glass insulators, and its lower end should always be carried down into damp soil. Care must be exercised that no masses of metal in the building be situated near the conductor, because if such a mass be greater than that of the rod, the lightning is liable to pass from the latter to the former. The point of the conductor should be carried about four or five feet above the highest chimney, and if it is of iron, it should be one-half an inch diameter for a building 40 feet high.

Steel Electrotypes.—Messrs. Salmon and Garnier place the newly-engraved copper plate in the bath, where, by their recently discovered process, it is duly coated with steel without the least hurt to the engraving. In this way is produced a steel plate for a copper plate, and steel being much harder than copper, a much greater number of impressions can be printed from the improved surface than from the simple plate. As soon as it shows signs of wear the surface of steel is dissolved, and a new surface formed by the means previously employed. This process will tend to reduce the price of really fine engravings, and if carefully followed up, the last impression will be scarcely less beautiful than the first.—*Exchange.*

Pure white lime, with about one ounce of dissolved glue to the gallon, is one of the best kinds of whitewash.

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PATENT LAW OF BRAZIL.

We are indebted to an American citizen—G. B. Zieber, residing in Rio Janeiro—for the annexed translation of the law of Brazil relating to the grant of Letters Patent for new inventions:—

"Let every one of our subjects know that the Parliament or General Assembly has determined, and we confirm, the following law:—

ART. I. The law assures to the discoverer or inventor of any useful industry the proprietary and exclusive use of his discovery or invention.

II. He who will improve a discovery or invention has, in the improvement, the right of a discoverer or inventor.

III. To the introducer of a foreign industry will be granted a reward proportioned to the utility and difficulty of the introduction.

IV. The right of the discoverer or inventor will be confirmed by a patent allowed gratis, payment only to made for the seal and workmanship; and to obtain it—

1. He will show, by a writing, that the industry to which it refers is of his own invention or discovery.

2. He will deposit in the public archives an exact and certain exposition of the means and process he has employed, with plans or delineations, drawings and models to explain it, without which the subject cannot be exactly elucidated.

V. The patents will be granted according to the qualities of the discovery or invention, for a term of 5 to 20 years, a special law being required for a longer time.

VI. If the government will buy the secret of the invention or discovery, he will order it to be published; but in case of only having granted a patent, the secret will be concealed till the expiration of the term allowed to the patent.

VII. The infringer or transgresser of a patent will lose the instruments and products; and will, besides, pay a fine equal to the tenth part of the value of the products manufactured, the costs being always subjected to the indemnification of loss and damages. The tools, instruments, products and fine will be given up to the owner of the patent.

VIII. He who possesses a patent may dispose of it as he likes, using it himself or pass it to one or several persons.

IX.—In case of their being two or more applicants for a patent (interested in the same invention) it will be granted to them collectively.

X. All patents will be finished and without effect, upon—

1. Being proved that the possessor has not been faithful and true in what he has said, or has been short or abridged, concealing any essential matter in the exposition or explanation made to obtain the patent.

2. Being proved not to be the original inventor or discoverer.

3. If the invention or discovery is not put into operation within two years after the granting of the patent.

4. If the inventor or discoverer has already obtained a patent in any foreign country; but in such a case, he will obtain, as an introducer, the right of the reward established in Art. III.

5. If the goods or objects made or manufactured are proved to be prejudicial to the public good or contrary to the laws.

6. Making public or using the invention before the patent is obtained.

XI. The government is authorized to order the patents to be passed according to the provisions of the present law, the king's attorney being always heard on it, &c.

XII. All the laws and provisions to the contrary are revoked.

Given at the Palace of Rio de Janeiro, on the 23d of August, 1830, the ninth year of the Independence and Empire, &c."

PATENT EXTENSIONS.

The Commissioner of Patents has lately extended, for seven years, the patent granted to Beriah Swift, deceased, August 16, 1845, for an Improvement in Grinding-mills. In this mill, the grinding is done between two plates. A series of cutting teeth are formed on each plate, which fit into furrows on the plate opposite. The furrows tend to keep the teeth sharp, and thus to render the machine, to a certain extent, self-sharpening. The improvement is said to be a most excellent one, and it is alleged that, owing to its self-sharpening qualities, it may be made to perform a given quantity of work in a better manner, with less power and in a less space of time, than any other mill of the sort. It is adapted to the grinding of coffee, spices, medicines. &c., and may be used by hand or with power, several sizes being manufactured. W. J. G. Lane, of Washington, Dutchess county, N. Y., is the assignee. The extension was obtained through the SCIENTIFIC AMERICAN Patent Agency.

Applications have been made by the following parties for the extension of their patents, viz.:

Wm. Cales Fuller, of England: Improvement in India-rubber Springs for Cars. Patented Oct. 25, 1845; hearing Oct. 17, 1859.

Christian V. Queen, of Peekskill, N. Y.: Improvement in Forges. Patented Nov. 18, 1845; hearing Nov. 7, 1859.

David B. Rogers, of Pittsburg, Pa.: Improvement in Cultivator-teeth. Patented Nov. 1, 1845; hearing Oct. 17, 1859.

John McFarrar (administrator of the inventor, Jos. E. Andrews, late of Boston, Mass.): Improvement in Planing-machines. Patented Nov. 21, 1845; hearing Nov. 7, 1859.

Application for extensions should be made more than 60 days prior to the extension of the patent. See our advertisement, in another column.

FIRE-PROOF COMPOSITION TO RESIST FIRE FOR FIVE HOURS.—Dissolve, in cold water, as much pearlash as it is capable of holding in solution, and wash or daub with it all the boards, wainscotting, timber, &c. Then diluting the same liquid with a little water, add to it such a portion of fine yellow clay as will make the mixture the same consistence as common paint; stir in a small quantity of paperhanger's flour paste to combine both the other substances. Give three coats of this mixture. When *dry*, apply the following mixture:—Put into a pot equal quantities of finely pulverized iron filings, brick-dust, and ashes: pour over them size or glue water; set the whole near a fire, and when warm stir them well together. With this liquid composition, or size, give one coat; and on its getting dry, give it a second coat. It resists fire for five hours, and prevents the wood from ever bursting into flames. It resists the ravages of fire, so as only to be reduced to coals or embers, without spreading the conflagration by additional flames; by which five clear hours are gained in removing valuable effects to a place of safety, as well as rescuing the lives of all the family from danger! Furniture, chairs, tables, &c., particularly staircases, may be so protected. Twenty pounds of finely sifted yellow clay, a pound and half of flour for making the paste, and one pound of pearl-ash, are sufficient to prepare a square rood of deal-boards. When the Chinese were told the risk we ran of being roasted alive in our many-storied mansions, they remarked, "What little land the English must possess, that compels them to build such *high* houses!"—*Builder*.

A GOOD INVESTMENT.—A correspondent (J. R. G.) writing to us recently from Louisville, Ky., says:—"I renewed my subscription to your valuable journal through Mr. Skene, and I also added one for my boy, who, although but 9 years old, always claims the first reading. We look upon the SCIENTIFIC AMERICAN as a kind of family pet, or, in other words, as a little savings-bank. I have been offered twice the original cost for the eight volumes which I possess. My son being now 9 years of age, I have reckoned that when he is 21, he will have 12 volumes of the SCIENTIFIC AMERICAN, which at the club rates will cost only $16·80; if then he should wish to sell them, they will (judging from the past) bring him $4 per volume, clear of binding, thus yielding $48, and giving a better result than a deposit in any savings-bank, in addition to the valuable information derived from its weekly reading. But enough! I am trespassing too much on your time."

ATTENTION.—A. Wykoff, of Elmira, N. Y., inventor of a tubular boring-machine for wooden pipes, desires us to say that letters are frequently misdirected to him at Rochester, N. Y., to which latter place they should not be sent.

A COLUMN OF INTERESTING VARIETIES.

The celebrated leaning-tower of Pisa is 315 feet high, and has an inclination from the perpendicular of 12 feet. .....A ball of iron, weighing 1,000 pounds at the level of the sea, would be perceived to have lost two pounds of its weight if taken to the top of a mountain four miles high—a spring balance being used; the attraction of gravitation being less at the top of a mountain than at the level surface of the earth.....A thick piece of iron, weighing half an ounce, loses in water nearly one-eighth of its weight; but if it is hammered out into a plate or vessel of such a size that it occupies eight times as much space as before, it loses its whole weight in water, and will float, just sinking to the brim. If made twice as large, it will displace one ounce of water, consequently twice its own weight. Every substance becomes lighter in water, in proportion to the amount of water displaced.....Most of the engines on the Great North of Scotland Railway have been provided with a smoke-consuming apparatus, the invention of Mr. D. K. Clark. The apparatus is very efficient, produces a saving of fuel, and the passengers are relieved from a great annoyance.....Wilmington, in North Carolina, is now lighted with wood-gas, which, it is stated, can be obtained more cheaply than coal-gas. A tun of coal yields about 10,000 cubic feet of gas, while one cord of wood produces 98,000 feet, in the production of light; being as seven to three in favor of ligneous gas over coal. .....Cotton is best adapted for lamp-wicks, because the arrangement of the fibers of the cotton-wick is such that the whole forms a bundle of minute tubes in which the oil ascends and supplies the flame by capillary attraction. .....The estimated force of gunpowder, when exploded, is at least 14,750 pounds on every square inch of surface which confines it.....Practical experience has demonstrated that the largest piece of ordnance which can be cast perfect, sound and free from flaws, is a mortar 13 inches in diameter; this would weigh about five tuns. The French, at the siege of Antwerp, made a mortar having a bore 20 inches in diameter; but it burst on the ninth time of firing.....The highest mountain in the world is 29,000 feet. Human footsteps have ascended 19,000 feet; to that hight M. Boussingault and Col. Hall clambered on the side of Chimborazo, in the Andes, the greatest elevation yet attained by man without leaving the surface in a balloon.....Madrid, the capital of Spain, is the highest of the European capitals; 200,000 people dwell at the elevation of 2,200 feet, on a naked desert plain, chilled by a biting breeze nine months of the year, and are baked the remaining three. The highest permanent residence in Europe is in the pass of Santa Maria—9,272 feet. In the Andes of South America, where a tropical temperature prevails, man dwells much more aloft than in Europe. Potosi, the highest city on the globe, on the celebrated metalliferous mountain, is 13,350 feet above the sea; and a post-house at Rumihuas is 15,540 feet, which is but a trifle below the peak of Mount Blanc, where mortal never stayed above two hours.....The pods of the bush known as "chapparal" are about the size of a large pea, and when they come to maturity, instead of opening in a quiet sort of a way, they do so with a report like a pop-gun, shooting the seeds 10 or 15 feet into the air.....At a temperature of 103°, liquid ammonia freezes into a colorless solid, heavier than the liquid itself.....A salt of lactic acid, gently heated, with five or six parts of oil of vitrol, yields an enormous quantity of perfectly pure carbonic oxyd gas.....The balance made by Ramsden for the Royal Society of London was so delicately poised that Mr. Pond, the astronomer-royal, found that the radiated warmth of his own body, when standing within a few inches of either extremity of the beam, was sufficient, by the produced expansion of that extremity, to cause it to preponderate.....Marine glue was patented by Mr. Jeffery, in 1842. It is formed by dissolving one pound of caoutchouc, in small pieces, in four gallons of coal naphtha, with frequent stirring, the solution occupying 10 or 12 days; two parts of shellac are then fused in an iron vessel and one part of the solution being well stirred in, the glue is pured out on slabs to cool. A joint made with this glue between two pieces of wood becomes stronger than the fibers of the wood itself.....The brilliant prismatic colors of the pearl are attributed to the decomposition and reflection of the light by the numerous minute grooves in its surface.

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IMPROVEMENT IN CORNISH ENGINES.

MESSRS. EDITORS:—I have for years, been watching with much interest for some improvement to be made in the efficiency and the more economical working of the so called Cornish and other pumping-engines, made in this country, and I regret to say that I am unable to find much, if any, and that, although in style of workmanship and amount of material they should be first-class engines, yet, it is universally conceded, they are quite inferior, in point of economy, to the English build.

This absence of improvement arises from a want of mechanical skill, as much as from the fact that our mechanics have not the proper inducements held out to them to exercise their ingenuity, and perfect their ideas in this direction. So that whilst the mower and reaper, the sewing machine, and even machines and articles of less importance are continually improved and improving, the great pumping engine almost glories in its stationary inferiority.

Allow me to suggest, for the consideration of water companies, engineers and others interested, a plan by which to bring the best mechanical knowledge, skill, and ingenuity of the country into competition, for the perfection of the pumping-engine. Should you desire an engine to do a certain amount of work, instead of asking for proposals for engine and pumps after a certain design, with certain boilers, &c., request proposals for engine and pumps of sufficient capacity to pump a certain number of cubic feet a required height per minute; the bid to be a certain sum per million pounds lifted one foot by the use of every hundred pounds of coal consumed, the price to be determined by the average working of the engine for say two weeks, of course specifying the style of workmanship, and requiring a strength of material sufficient to warrant the continuous working of the machinery.

For example, suppose the work to be done required an engine capable of performing a duty of 90 millions. A mechanic proposes to build such an one at the rate of $500, per million; if on trial the engine proves itself able to do this duty, the price will be $500 × 90, = $45,000, but if it should only perform 25 millions, then the price would be $500 × 25, = $12,500.

This plan you will see works with justice to all parties; while it guarantees to the parties desiring the work the best machinery the mechanic can build, it secures to the mechanic pay according to the merit of his work, and at the same time it offers to him every inducement to increase the efficiency and economical working of his engine by the addition of such real practical improvement as his ingenuity and the experience of others may have proved to be advantageous.

JOHN WEST.

Morristown, Pa., August 15, 1859.

PUMPING WATER.

MESSRS. EDITORS:—Your Canadian correspondent, on page 85, would find it impossible to irrigate his grounds on the plan proposed by him, and I quite agree with your correspondent, J. B., of Newark, N. J., in his views.

The only real, practical way of drawing water long distances, in large quantities, is to lay a horizontal pipe or one sufficiently inclining, so that the water may freely flow into the pump-well of itself, and then raise it in as short a pipe as possible.

For all hights under 20 feet of suction, a good reciprocating pump will answer a good purpose; but where water is to be raised a greater hight than that, a rotary or continuous pump is preferable. The reasons are obvious; water, in one of its characteristics, being a solid, the sudden stopping and starting of a large column of water will soon destroy the best reciprocating pumps.

The New York Central Railroad shop, at Syracuse, raises water by suction only 24 feet; yet the best constructed reciprocating pumps, of various patterns, which have been tried, were constantly out of order. Two years ago they put in a rotary pump, which has run successfully ever since.

With a rotary or continuous pump, your Canadian correspondent might draw water successfully half a mile, not exceeding 16 feet elevation, provided his suction-pipe was nearly air-tight.

When water is raised by a reciprocating engine to a hight of 20 feet and over, the pumps must be of long stroke, and work very slow; otherwise, the pressure of the atmosphere will not be sufficient to cause the water to follow the plunger, and the vacuum that is created will cause a concussion on the return of the piston that will rapidly destroy the best constructed machinery.

W.

Elmira, N. Y., August 11, 1859.

[Our correspondent is perfectly correct in regard to laying the long suction-pipe in such a manner as to allow the water to flow into its entire length by gravity, and thus the pump will only be required to move the short column in lifting. But, in most situations, this necessitates a deep cutting to lay the pipes, thus involving a great original outlay. What is wanted is to draw water from a considerable distance, and to lift it as high as possible, with the least expenditure of power and money.—EDS.

CANNEL COAL AND ITS OILS

MESSRS. EDITORS:—The manufacture of coal-oils, owing to the brilliancy of its light, its economy and safety, has become a matter of general interest. By geological surveys, the discovery has been made that we have very large deposits of cannel coal. This is very cheering information. The light of oil obtained from pure cannel coal is estimated to be 10 times more brilliant and powerful than that of the best sperm oil, and five times that of the gas of our city. Its cost is in the same proportion, or about one-fifth of that of gas; while, in point of safety, it is perfect. A lighted match dipped in the oil will not cause an explosion or set the oil on fire.

There are are several spurious mixtures thrown into the market, and of a highly dangerous character, which have the external appearance, smell, &c., of pure oil, but are explosive. A small portion (a thimble-full) placed in an open vessel, and a match applied, will at once expose the character of the oil. This spurious article is composed of coal-oil, turpentine and alcohol.

There are at present two mines of the true cannel coal known on this continent. The one is at Prince Edward's Island—the "Prince Albert Mine"—the other is at the "Forest Hill Mine," in Fayette county, Va. The nature and composition of this latter coal is such, that when exposed to the rays of the sun, it becomes soft and "elastic as manufactured india-rubber," and when laid upon a heated surface, the oil is seen to trickle from it as from a lump of fat. It is of a jetty black appearance, with conchoidal fracture, is unctious to the touch, and can be lighted with a common match. It burns with a clear, bright flame, and smokes.

Large quantities of oil are now being thrown into the market, manufactured from bituminous coal. This produces a feeble light, and, in some cases, will not give any.

The coal from "Prince Albert Mines" is mainly consumed at the works on Hunter's Creek, Long Island; that from "Forest Hill Mine" is mainly consumed by the Forest Hill Mining and Manufacturing Company, whose works are situated on the premises, near Cannelton, Kanawha county, Va., and are under the personal charge of Professor H. H. Eames.

L. A. R.

New York City, August 15, 1859.

NEW INVENTIONS.

ARGAND GAS-BURNER.—Hippolyte Monier, of Paris, France, has invented an improvement in these useful illuminators, which consists in combining metal with burnt clay-porcelain, or other incorrodible, refractory, non-conductor, whereby these incorrodible substances can be used for those parts where it is desirable, and metal can be used for the portions where it is most needed.

SHAPING AND PRESSING BONNETS.—C. W. Russell, Philadelphia, Pa., has invented improvements in both these processes. The usual method of forming bonnets, hats, &c., of an old pattern according to the fashion, is to wet them and force them over the new block, by the aids of pins or needles, commencing at the crown of the bonnet or hat, and working it up to the block with the fingers, and fastening the several parts to the block by means of pins until the whole bonnet has assumed the shape of the block. This method is not only very tedious, but it is also insufficient, in such cases where the shape of the hat differs considerably from that of the block. The object of the first invention is to do this work not only quickly, but also very perfectly in all cases and it consists in pressing and retaining the bonnet to the block by means of a cord which is wound several times and in different directions over the crown and body of the bonnet and which is retained in its position by a hook on the back part of the block and by a series of hooks attached to a strip of cloth which is drawn over the front part of the bonnet, so that each part of the latter is forced up tightly to, and retained on the block, where it is left to dry until it assumes the desired shape. The principle object of the second invention is to connect the lever which carries the pressing iron with the treadle in such a manner that the pressing surface of the iron may be brought to act upon the bonnet in any desired direction by merely depressing the treadle and without the aid of the hands.

TAPPING WATER MAINS.—J. B. Quigley, of Trenton, N.J., has made an invention that relates to an improved mode of attaching the branch or service pipes to the street main. The method of accomplishing this at present is attended with much inconvenience, and in many instances a great loss of water, the usual practice being to shut of the water, sometimes for whole blocks, until a hole is drilled through the main pipe, and the branch pipe properly fixed thereto. This invention obviates these objections, and the pipe is introduced into the main without stopping the flow of water, and it consists in a peculiar device which is attached to the main for the purpose of holding the drills, so that a hole can be bored nearly through the pipe, leaving a thin scale of metal. A ferule is then introduced in the hole, which is attached to the service pipe, a few blows then break the scale of metal and the atttachment is complete.

SHOE-PEGGING MACHINE.—The object of this invention is to obtain a simple, economical and efficient device for pegging boots and shoes by manual operation—a device by which the work may be done with all the perfections accomplished by the complicated automatic machines invented for the purpose. It consists in having an awl and punch attached to a sliding plate which is fitted within a box having a lateral movement, the box being fitted on guide rods in a stock and before a peg trough filled with pegs, the whole being arranged in such a way that by striking the plate having the awl and punch secured to it, the peg-holes will be made in the sole, and the pegs driven therein, the device being fed along around the sole by the downward movement of the of the awl and peg-plate. The inventor is W. R. Landfear, of Hartford, Conn. An engraving of this invention will shortly appear in our columns.

MACHINE FOR MAKING PAPER BAGS.—William Goodale, of Clinton, Mass., has invented a new machine for manufacturing these useful articles, and the invention relates, firstly, to an improved pasting apparatus for applying the paste to the edge of the paper for the purpose of forming seems in the bags; it also relates so an improved system of feed and measuring rollers, for supplying the paper from a roll or continuous piece to the cutting and folding machinery; and it also relates to a drop applied in combination with the cutter, which cuts the paper from the roll or sheet to the proper shape to form the bag for the purpose of holding the paper close to the knife during the cutting operation. There is also a plate employed to fold the bag upon, which is either narrower than the bag, or the same width, but stouter, and there are improvements in the creasing and folding apparatus for the sides and bottom of the bag.

NAIL FEEDER.—A griper having a peculiar operation for the purpose of conveying the rod to the forging or pointing apparatus of a wrought nail machine, and of holding it during the forging or pointing operation, is employed in this invention; the griper also conveys the nail after it has been forged or pointed to the cutter to separate it from the bar. A gage is combined with the cutters to ensure the nail being a proper size. The inventor is Daniel Dodge, of Keeseville, N. Y.

IMPROVED GRINDING-MILL.—The object of this invention is to regulate the runner stone of a grinding-mill by a compensating device which will allow the stone to raise and free itself of any hard substance getting between the faces of the stones, and which would injure the face and derange the mill; and also to form a passage in the eye of the upper stone which will allow the grain to have a constant and free flow from the hopper and not be affected by the centrifugal action of the runners in its passage from the center of it to be ground. The invention fulfils these objects, and the inventor is, Charles W. Brown of Boston, Mass.

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IMPROVED STUMP EXTRACTOR.

There is many an acre of land now lying barren and unprofitable, which, if the stumps and rocks were extracted and the ground tilled, would become fertile and productive, and savage wilderness rejoice with ripening corn. If this be the case, any one of common sense will ask why are these stumps not extracted? and we can only reply we cannot tell. There are many machines to perform the work, an excellent one being the subject of our engraving.

We have shown it in operation; A, being a frame mounted on wheels, B, and C, D, E, are three parallel shafts placed in bearings on the frame. A. The shaft C is the driving shaft, and has a pulley, F, on one end at the outer side of the frame, which receives a rope or chain, G, to which the animal is attached to operate the machine. On the other end of the shaft a pinion, G', is placed that gears into a wheel, H, on D; H also gears into a pinion on E.

The shaft D, is a double cone, grooved spirally from its ends to its center, one being a left and the other a right handed groove. J is a rope or chain, the ends of which are attached to the ends of D, so that as D is rotated in one direction the two ends of the chain or rope will be unwound off D, and *vice versa*. A ratchet, K, is also placed on D, provided with a holding pawl, L, that prevents D turning backwards when not required.

The shaft E at one end is also made conical and grooved, and a rope M, is attached to it, the other end passing around a pulley, N, is attached to the pulley J', through which J runs.

O is a strut, the lower end of which rests on the ground, near the stump, and a chain, P, passes over it, one end being attached to the stump, and the other end to J'.

When the machine is placed in a proper position, and the back part of the machine secured by a rope or chain, A' the animal is made to pull the rope or chain, G, and the chain, J, will be wound round D, with great power, but as the stump becomes loosened the power diminishes and the speed increases. The rope M, and shaft E, are left off the machine for a stump extractor, but when it is used as a press they are used, so that the animal backs after the follower has done its work, on the pulley, F, being turned, the rope, M, takes up the slack of J, and prevents it dragging or getting into kinks or other annoyances.

For elevating rocks the machine is mounted on higher wheels and placed directly over the rock to be lifted, which has two holes drilled in at opposite sides, and properly shaped callipers being placed in these holes and the chain J, being connected with them, the rock can be lifted from its bed and carried to the place it is intended to leave it. The machine is very strong, easy of transportation and cheap, and is a valuable addition to the agriculturist's and engineer's stock in trade. The inventor is G. D. Harris, of Fitchburg, Mass., and he obtained a patent April 5, 1859. He will be happy to furnish any more information that may be desired.

A HINT TO BUILDERS OF CHURCHES.

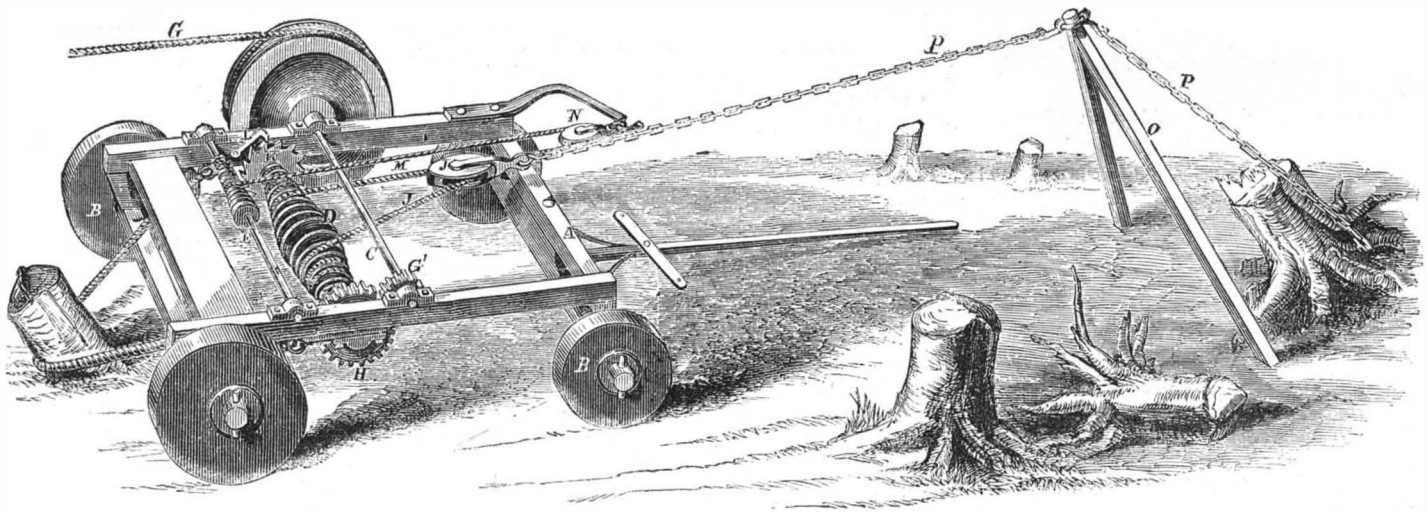
MESSRS. EDITORS:—The most of our churches are placed between other buildings, thus leaving very little room for the circulation of fresh air through the side windows. I believe that slat instead of solid doors at the entrance, and a good ventilator behind the pulpit, would render our churches more comfortable in the summer. I also believe that the ceilings under the galleries, toward the walls, could be much improved by raising them a trifle towards the center of the building to allow the heat in winter, and foul air in summer, to escape from under them.

On one winter morning I found the thermometer at 62° in the center of the Sixth-street Baptist church, and 74° under the galleries near the walls—the heat decreasing gradually towards the center.

A. JENNY.

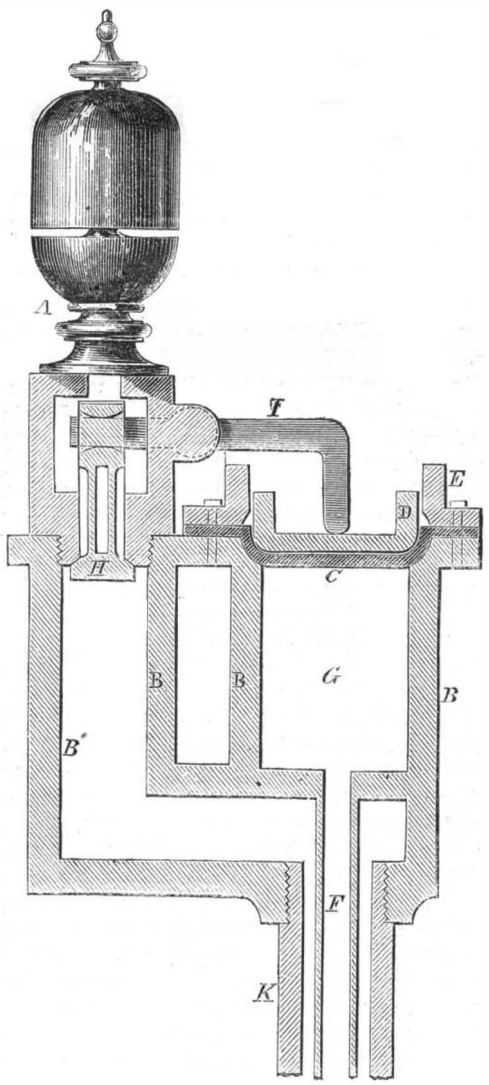
New York, August 29, 1859.

NEW PATENT STUMP EXTRACTOR.



IMPROVED LOW WATER INDICATOR.

This indicator acts by the expansion of water in a closed vessel, when exposed to a much higher temperature than its normal one, so that its force is exerted to open a valve, through which the steam can pass, and call attention to the state of the water in the boiler by a whistle. Our engraving, which is a section, will explain the construction.



B is a cast-iron outside case or box, on the top of one side of which is a valve that opens or closes the communication with the steam-whistle, A. This valve is operated by a lever, I, one end of which is bent over and rests in the inside of the cup, D, that lies in the flange, E, upon the diaphragm, C. Under this diaphragm is the chamber, G, and closed pipe, F, which extends some distance down the pipe, K, that connects the apparatus with the boiler. This pipe, K, passes into the boiler, its open end being placed in the water the required distance below which the water must not fall.

The operation is very simple. When the chamber, G, and pipe, F, are filled with water, and the pipe, K, is adjusted to the boiler, so long as there is plenty of water in the boiler, no effect takes place; but the moment the water falls below its proper level the steam rushes up the pipe, K, and surrounds the pipe, F, and chamber, G, causing the water in them to be expanded, and so to raise the diaphragm, C, and elevate the followers or cups, D, and so, through the medium of the lever I, open the valve, H, and permit of the escape of the steam through the whistle, A.

There is not in this invention any metallic plug, which might, perchance, become corroded; but all parts are simple, and it is so easy of construction that the cost is very low. The inventors are J. W. Hoard and G. B. Wiggins, of Providence, R. I., who will be happy to furnish any further information, upon being addressed as above.

SUPER-PHOSPHATE OF LIME.—As bones are not soluble in water they require to be decomposed with an acid in order to make them give out their phosphates rapidly, when applied to the soil. A very simple method of rendering bones soluble is described in the *Rural Register*, (Baltimore, Md.) as follows:—The bones are first broken into small pieces with a hammer and are put in at the rate of three bushels to half a hogshead of water, then 75 lbs. of vitriol are added. In this they are suffered to remain from two to four weeks, being stirred up occasionally with a stick, then the contents of the hogshead are placed in a large iron cauldron to which a moderate fire is applied, when the whole becomes a perfect jelly. This is now mixed with a cartload of rich earth, or ashes, and half a barrel of plaster, and forms a rich compost for an acre of land, for any crop. The cost for an acre is, bones 75 cents, vitriol $1.87, plaster 56 cts., total $3.18. Bones in any form never fail to show their striking effects on clover or other grasses.

BONES AND WHEAT.—According to Sir Robert Kane, the distinguished chemist, one pound of bones contains the phosphoric acid of 28 pounds of wheat. A crop of wheat of 40 bushels per acre, and 60 pounds per bushel, weighs 2,400 pounds, and therefore requires about 86 pounds of bones to supply it with that essential material. The usual supply of bone-dust (3 to 4 cwt. per acre) supplies each of the crops for four years with a sufficiency of phosphoric acid, which is given out as the bones decompose. It may therefore be conceived what would be the effect of a double dressing of bones, renewed each year from time to time, by additional doses, all giving out the phosphoric acid by the slow process of decomposition.

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VOL. I., No. 10.....[NEW SERIES.].....*Fifteenth Year.*

NEW YORK, SATURDAY, SEPTEMBER 3, 1859.

MAGNETISM ON RAILROADS.

MAGNETISM is one of the most subtile and wonderful agencies of nature, and the genius of man has been exercised in a thousand modes to render its power subservient to his purposes. In this he has been successful in applying it to the compass for navigation and surveying, and to the magneto-electric machine, which is employed to a very limited extent in England for electro-plating. The usefulness of the compass depends upon its needle assuming a position by which its poles are attracted to point continually north and south, being thus directed by the great magnetic currents of the earth. In itself the magnet possesses a great attractive force for drawing certain metals towards it and retaining them in contact, and it was by this peculiar property originally known. It was supposed by some nations, during the dark days of superstition, that a spirit dwelt in the loadstone, which, in certain cases, exercised its power for evil purposes, and many shipwrecks were once attributed to its influence. Imagination fixed huge magnetic rocks in several dangerous seas, which drew out every spike and fastening from all vessels that came within their influence, and down went every one on board to the bottom of the deep. The story of "Sinbad the Sailor" and his shipwreck at the loadstone mountain is founded upon actual tradition.

The inherent attractive force of the magnet, as it costs nothing, has been frequently the subject of study to inventors, as affording a probably, cheap and constant power for moving machinery, and also for securing perpetual motion. This never can be effected; neither a constant rotary nor reciprocating rectilinear motion in machinery can be produced by permanent magnets, as the attractive force requires to be nullified or suspended in order to produce motion in an opposite direction. There is another kind of magnet, however, by which machinery may be moved; but this is owing to a totally opposite principle in it from the loadstone. The magnetism of the latter is permanent, that of the former is temporary—it is a powerful magnet this instant, a piece of inert iron the next. This is the electro-magnet. It is composed of a piece of very pure soft iron forming the core for a helix of insulated copper wire wrapt around it. When the ends of the helical wire are placed in the circuit of a voltaic battery, the soft iron at once becomes a powerful magnet; but when the circuit is broken, the iron as suddenly ceases to attract. By placing a series of such magnets in a circle or in a line, and throwing the voltaic current alternately from one to the other by keys, to attract a wheel or a piston, rotary and reciprocating electro-magnetic engines, like those of Professors Page, Vergnes, and others, have been produced. Such motors are too expensive for operating machinery, in general, in comparison with steam and water power; but for some situations and purposes, such as for small machines like those used for sewing, which require to be frequently stopped and set in motion, they may yet be applied with convenience and economy.

Another application of such magnetism has recently been brought in a very prominent manner before our people, viz.: magnetizing the driving-wheels of locomotives to increase their traction on the rails, as noticed in our last issue. The paper read on this subject before the late meeting of the Association for the Advancement of Science, related the experiments of E. W. Serrell, C. E., in testing the efficacy and utility of such magnets for this purpose. With two batteries of intensity, containing 16 cups each, having 300 square inches of zinc surface, a magnetic attraction, equal in power to 38 pounds of steam pressure on the square inch of piston area, was obtained between the rails and the wheels, or, as has been stated, an additional adhesion of seventy-five per cent. The lower segments of the two driving-wheels were fitted with insulated helices of No. 8 copper wire, each 2,700 feet long. The wheels were four and a half feet in diameter and weighed 1,100 lbs. each; one wheel had south and the other north polarity. On a very slippery rail 19 lbs. of steam per inch slipped the wheels without magnetism; under the same conditions 35 lbs. were required to slip them when magnetized. On a very clean rail and everything being favorable, 50 lbs. of steam were required without any magnet, and 88 lbs. when magnetized.

This application of electro-magnetism was stated by Mr. Serrell not to be new, but that, from previously ascertained facts, all that had been done before him was of a discouraging character; and it was against "a unanimous *no*," to the probabilities of success, that he persevered and obtained such favorable results. In 1852, a German mechanic, named Nickles, tried similar experiments, and it was stated in *Chambers' Journal* that these had been made with large locomotives in full operation, and that they were quite successful. If they were, however, it is remarkable that they fell to the ground as undeserving the attention of engineers, and if the experiments of Mr. Serrell have been as effective and useful as it has been stated they were, we certainly have arrived at a new achievement in railroad operations deserving the attention of all men. It is calculated that $26,000,000 per annum is the cost of depreciation in our railroad structures, principally caused by the use of heavy locomotives, their great weight being required to produce the necessary traction. From this it has been inferred that, with locomotives of 20 tuns weight, having magnetized wheels, as much work can be done as with other locomotives weighing 40 tuns, and thus save a great amount of wear and tear in the rails and permanent way. Our opinion is at variance with such a conclusion, and we base our views upon the nature of the electro-magnet. The increased adhesion of a magnetized locomotive wheel is caused by inducing polarity in the rail, and it must take as much power to break the magnetic contact between the wheel and rail as that which induced their mutual attraction. According to this view, whatever is gained by increased adhesion is at the expense of steam power. While this is our opinion, we think Mr. Serrell deserves great praise for what he has done to test the question, and further experiments (which we understand are to be undertaken) may prove that his application of electro-magnetism may be profitably applied to every locomotive in our country. A correspondent (O. H. Needham, M.D., of this city) states, in a letter to us, that if he had been worth a few thousand dollars five years ago, his electro-magnetic brake, combined with an electro-magnet tractor, would now be embodied in all the locomotives running. He has perfect confidence in the utility, economy and adaptability of electro-magnetism to locomotives for producing new and important results.

THE LABOR QUESTION.

One of the greatest struggles that has ever taken place between employers and their workmen has lately been going on in London. As we understand the question, all the operative builders of that city resolved some time ago to obtain a reduction of the hours of labor from ten to nine, daily; and, in order to secure this result, they planned a campaign of aggression upon the most scientific strategetical principles. Their mode of operation was to demand their terms from each master-builder in succession, and to "strike" against only one at once, and those remaining at work were to support those on strike, until all the employers were vanquished in rotation. The master-builders having been informed of this skillfully-planned design, resolved to prevent the result which might flow from it by forming a counter combination, and demanding that all the operatives should abandon their position. This they refused to do; and the whole question, as it now stands, resolves itself into the simple fact, that the master-builders of London have struck against their operatives—about 90,000 in number—to prevent an anticipated reduction of the hours of daily labor. The journeymen-builders of London work 10 hours during the first five days of the week, and only eight on Saturday, and their wages is about $1.32 per day. Their employers waited upon the Home Secretary, Sir G. C. Lewis, in order to solicit his influence, and that of the House of Commons, against their workmen; but the Home Secretary snubbed them, and said "the government made no distinction between classes." He told them that if it were wrong, as they had expressed themselves, for the workmen to form combinations, it was equally wrong for them, as employers, to do so. The employers contend that the claims of the operatives are unreasonable and unjust; the latter retort, and say the same opposition and arguments were used in former times against reducing the hours of labor from 14 to 12, and from 12 to 10, "and if bank and government clerks work only six, seven and eight hours daily, why should mechanics, whose pay is smaller and labor more severe, work 10 hours per day?"

Public opinion in London and the whole kingdom appears to be on the side of the operatives, and it is believed that a compromise will soon be effected between them and their employers, as the subject has been taken up in the House of Commons, and a bill brought in to establish equitable councils of conciliation between such parties.

In the city of Albany, N. Y., a very extensive strike among the molders has been going on for some months, and far more to the injury of the employers than the operatives. Both parties are formed into opposing combinations, and each employer, it is stated, is pledged to a forfeit of some thousands of dollars if he submits to his molders' demands without the consent of all the other employers. In the neighboring city of Troy, N. Y., the master-molders acquiesced in like demands that were made by their operatives, and, as a consequence, they have large orders to fill which otherwise would have been executed in Albany; and much business has thus been diverted from the latter city.

The coal-miners in Pittsburgh, Pa., and its neighborhood, to the number of 3,000, are also out on a strike at present. They demand that the coal which they mine shall be weighed at the mouth of the pit, and not measured, according to the practice heretofore pursued. They assert that the cars by which their coals have been measured have been enlarged in size, and that they have to furnish more coal for the same compensation. The employers assert that it would be a great increase of their expenses to weigh the coal, and that it would be of no benefit to either party.

Several other minor strikes are now going on in various parts of our country, and the labor question appears to be assuming greater importance than it has done for a great number of years past. Those conflicts between capital and labor, which we call "strikes," are to be deplored, because they do injury to all parties. We would greatly rejoice if some means, such as courts of conciliation, were organized to prevent them by settling disputed questions upon equitable principles.

HINTS TO THINKERS.

In this world there are two lines of knowledge, two trains of thought the mind can follow, two roads on which the inquirer can travel—the positive and the speculative. Although they both start from the same point, yet like the boundaries of an angle, they continually diverge and lead in very opposite directions, to very different results. The starting point may be said to be, the God-implanted spirit of inquiry, and the results are, respectively, firm unshaken truth and doubtful wavering error. These are the extremes, the happy medium lies in the bi-section of the angle, hard fact enjoyed in conjunction with a regulated imagination. On this line lies what we call the poetry of science, the dignity of labor, and the majesty of toil. To illustrate:

The strata which is below the coal beds was particularly adapted for the growth of certain kinds of plants, which when they decayed or were imbedded, by slow decomposition have formed coal. This is the simple fact. But geology's poet—Hugh Miller—has brought the very scene before our eyes, has made us actors in the very epoch, and while scientifically accurate, has placed a halo of romance around this operation of nature. He blended actual fact and a vivid imagination, always (as he

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should) making the latter subservient to the the former.

Again, we talk of the dignity of labor, and the majesty of toil. Which of us while at our avocation, whether of brain or hand, think, at the time the mental energy or physical strength is in use, that it is anything but work; work the necessity, not the pleasure. But when the book is written, the money made, the end accomplished, the rail-road built, the machine erected or the land tilled, and we see the results of our work and exertion, in the period of our recuperation, it is then that we feel that we are dignified, are majestic, and we feel grateful to the toil and labor which has made us so.

To moralize: No man should learn hard facts alone, let him acquire those which especially apertain to his business, and the comforts and affections of home, or the excitement of travel will balance these; but should he from inclination or ambition strive to acquire more, in order to keep on the line that bi-sects the angle, he must estheticise his knowledge, that is to say, he must find a poetry in the facts and a broad meaning for the worlds' good, in the phenomena. There must be a tendency to ponder and moralize, as well as to investigate, and the results of his moralizing must be based on a perfect knowledge of the premises. The want of this has caused the many errors of the day; the desire to strike out something new—to be original—being strong in man. The most original thinkers have been the most surprised at their own thoughts. With tyros (for whom we now especially write) this is a common fault. Learn well, first as a study; then speculate, as a recreation; and "isms" in knowledge will cease and wither before the overwhelming tide of common sense.

These may be called platitudes, but it is necessary now and then to reiterate them in order to regulate the investigations and thoughts of the day. Everyone will not take the trouble to read large books on the discipline of the mind, and a few remarks thereon are often useful to such thinking men as form the readers of the journals and periodicals of the day.

THE ATLANTIC TELEGRAPH & INVENTORS.

The secretary—Mr. George Saward—of the Atlantic Telegraph Company, invites inventors, patentees, and manufacturers of submarine cables to send plans or specimens of their cables calculated for laying across the Atlantic, to him at the office, 22 Old Broad-street, London. Accompanying this invitation, which has been advertised in the London papers, he states that the object of soliciting specimen cables and plans is to submit them to the consulting committee of the company "for examination, testing and experiment."

The names of those who compose the *Consulting Committee*, are not given in the advertisement, but we will give them for the benefit of those who may have the curiosity to know who they are. R. Stephenson, M. P., C. E.; I. K. Brunel, F. R. S.; E. Clark, C. E.; G. P. Bidder, C. E,; J. Hawkshaw, C. E.; J. Longridge, C. E.; Professor Wheatstone, F. R. S.; W. A. Miller, F. R. S.; Professor Morse; Professor Henry, Washington; Professor Bache, U. S. Coast Survey; Lieut. Maury; and W. E. Everett, C. E. Among this number there is not one to whom exception can be taken as a man of science, but excepting Wheatstone, Henry and Morse, we never heard of any of them be ingdistinguished, theoretically or practically in electric engineering. It would have been well had there been fewer civil engineers and more practical telegraphic operators in the consulting committee. There is something, no doubt, to be gained in influence, by presenting the names of such distinguished men, but at the same time it appears to us that these names have been obtained more for the purpose of giving dignity to the company, so as to give confidence to the public, than for the purpose of working out the best means of operation, both for testing the cable and laying it. The honorary consulting electrician is Professor Thomson, of Glasgow, the regular consulting electrician is C. F. Varley, London—both able men. No contract to commence operations for making a new cable will be made until $1,500,000 are subscribed, and if this sum is not obtained the deposits that may be paid in will be returned to subscribers. The company is guaranteed a sum of $170,000 from the British and American governments if the cable is laid and worked successfully. The new capital will consist of 120,000 shares at £5 (about $25) each; this is called *preferential*, because the subscribers to it are to be first paid 8 per cent from the profits, then, if there are any dregs left, the old shareholders are to get them. Old friends are generally the sufferers in such enterprizes, like the original subscribers to the New York and Erie Railroad. We really hope, however, that the requisite amount for constructing and laying a cable will be obtained, and that at no very distant day from this. It has been stated that a proposition was made to raise the old cable and use all the parts of it that are sound; but we hope no attempt will be made to carry out such a preposterous idea. The old cable was totally defective in nature and construction, and the gross want of science displayed in its selection has left a very unfavorable impression on the public mind regarding the company—its directors, secretary, and all its officers.

A SPLENDID NUMBER OF THE SCIENTIFIC AMERICAN!

We are now preparing, and shall publish in the course of two or three weeks, the largest and most splendid number of the SCIENTIFIC AMERICAN ever issued. It will contain eight pages more than the regular issue, making in all 24 pages, with about 25 engravings executed in our usual style. As we announced at the beginning of the New Series, we shall spare neither time, talent nor expense in keeping the SCIENTIFIC AMERICAN what it is recognized to be—*the most useful and best conducted journal of its kind extant.*

We trust that our friends will use their endeavors to promote the circulation of our journal, thereby not only favoring us, but at the same time greatly benefiting every branch of industry in our country. As a practical commentary upon this suggestion, we present herewith a notice taken from the Brooklyn *Daily Times*:—

THE SCIENTIFIC AMERICAN.—We were conversing with a tradesman the other day, who assured us that he would not miss taking the SCIENTIFIC AMERICAN on any account, and referred particularly to one improvement which he had been able to make in his business from a hint given in its columns, which added largely to his profits. Among the useful contents of this week's number is full information relative to patents as well as to all the matters interesting to the mechanical and scientific world. We notice a preventive of the frequent casualties by burning fluid which distress our readers and occupy our columns. If a garment be steeped in a mixture of phosphate of ammonia and sal-ammoniac, it is rendered as nearly fireproof as can be desired. All ladies who use burning fluid should try this recipe.

INVENTORS' EXCHANGE.

We have been often solicited to connect with our business, as solicitors of patents, an office for the purchase, sale and exchange of patents and patent property. We have always taken the ground that it was not compatible to connect the business of soliciting of patents and the sale of inventions together, for many reasons obvious to the understanding of inventors. We have, therefore, always declined to take any pecuniary interest in inventions; and so long as we continue to act as attorneys for soliciting patents for others, we shall refuse to become interested in any patents or inventions, so that no person can have a pretense for accusing us of neglect or imputing to us unworthy motives in conducting his business. In this respect we are bound to take the Bible doctrine, and abstain from all appearance of evil. In connection with these remarks, however, it is proper to inform inventors that an Inventor's Exchange has recently been opened by Messrs. S. A. Heath & Co., on the same floor with our extensive offices (but in no way, directly or indirectly, connected with the SCIENTIFIC AMERICAN Office); and those of our readers who desire an agent in this city to dispose of their patents, or to purchase for them good inventions, are recommended to correspond with Messrs. Heath & Co. direct. Messrs. H. & Co. inform us they have made extensive arrangements for exhibiting machines and models at the coming fair of the American Institute, and desire us to state that they will have efficient persons in attendance to describe the operation of the machinery which they will exhibit, and make sales of territorial rights, or solicit orders for machines, as the parties employing them may direct.

BURNHAM'S WATER WHEEL.—We learn since writing the description published on page 56, present volume, SCIENTIFIC AMERICAN, that at one mill it drives two pair of five feet corn stones and one pair of five feet wheel burrs, and grinds 21 bushels of grain per hour, besides driving all the machinery in the mill. The wheel is six feet in diameter and works under a six-foot head and face of water.

FOREIGN SUMMARY—METALS AND MARKETS.

The great prominent event of the week is the completion of the *Great Eastern* on the 8th ult.—the time specified for this result in J. Scott Russell's contract. On the subsequent day this achievement was celebrated by a grand banquet on board, at which there was quite an array of great men. There are two steam cranes on the decks for loading and unloading, and 5,000 tuns of coal can be put into the bunkers in 24 hours. The fittings of the main saloon are magnificent, but several minor rooms are not to be completely furnished until the first voyage is made; still they are very neatly arranged. All the rooms and cabins are very lofty in the ceiling, being about 15 feet in the clear, which will make them exceedingly pleasant. The engines were tried before the invited guests sat down to dinner. She has separate sets for the two side-wheels and the stern propeller. The former were built by Boulton & Watt, the latter by Scott Russell; and great interest was excited in regard to their performance. Those for the side-wheels consist of four oscillating cylinders, each of 74 inches diameter and 14 feet stroke. Each forms a complete engine in itself, capable of easy connection and disconnection, and when united, they make four entire combined engines. Those for the screw are also four in number. Each cylinder is 84 inches bore and only four feet stroke, so as to work at the rate of 45 strokes per minute, with steam at 15 lbs. on the square inch, cutting off at one-third the stroke. The united power of the two classes of engines is 12,000 horse. Of course this power must be generated in the boilers, which are said to be very strong and sufficient to supply the requisite amount of steam. When loaded, this vessel will weigh about 30,000 tuns, and, when driven by the 12,000 H. P. engines, a speed of 22 miles per hour is expected to be attained. In 1641—two hundred years ago—the navy of England consisted of 42 ships, the aggregate tonnage of which was 22,511 tuns; now, what do we see in the progress of two centuries in England? One single steamship, belonging to the merchant navy, of a greater capacity than the whole fleet of the kingdom in the days of Cromwell. The engines of this great ship worked beautifully when put in operation, and the result was considered by all the engineers on board to be satisfactory in the highest degree and beyond what could have been expected. It is stated that her first ocean voyage will be to Portland, Maine; but she was built for the East India trade, and this is to be her ultimate destiny. In cases of emergency she can carry 10,000 soldiers, besides her crew, with all their equipments of war, and will be able to run down the largest frigate in the world as easily as one of our river steamers can run down a row-boat. This is the grandest experiment in ship-building ever attempted since the Deluge, and nowhere out of London, we believe, could the men and money have been secured for such a gigantic venture.

R. Mushet, the well-known metallurgist, has recently obtained two patents for new alloys of metals. One is for a compound of cast-iron and metallic tungsten; the other for combining a small portion of tungsten with cast-steel, whereby the quality of the latter is stated to be greatly improved.

Mr. C. Beslay, of Paris, has lately secured a patent for coating articles of iron or steel with tin, zinc or lead, or alloys of these metal, by electrical deposit. In the galvanic batteries which he employs for depositing these metals on the iron or steel, such as knives, &c., he employs a solution of caustic soda or potash instead of acids. The alkaline solution dissolves the tin and lead to form the coating without engendering any tendency to oxydise the metal which is to be coated, and thus a very permanent and adhesive deposit is made.

At a late meeting of the Electric and International Telegraph Company, held in London, a dividend of 6½ per cent per annum was declared. R. Stephenson, M. P., acted as chairman, and in making some remarks, he recommended a large reserve fund to meet the expense of wear in the cables. He stated that some submarine cables were worn out in five years, others in ten, and as the company had expended £140,000 in cables, £14,000 should be laid past as a reserve every year to renew their cables in ten.

THE DEMAND FOR COTTON.—The efforts of the Manchester Cotton Supply Association seem to be producing some good results in spreading the cultivation of cotton,

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in various countries. During the past 10 years the supplies from other sources than the United States have increased four per cent, but the demands have increased to no less than 45 per cent. The cultivation of Sea Island cotton has been commenced in Moretown Bay, Australia, but with what success we have not yet been able to learn.

PRICES OF FOREIGN METALS, AUGUST 11.

	£	s.	d.		£	s.	d.
Iron, English Bar and Bolt:—				Iron, Swedish, bars, per tun	13	0	0
In London, per tun.	7	0	0	Russian C C N D..	17	0	0
In Wales	6	0	0	Steel, Swedish Keg, nom	18	10	0
In Liverpool	6	10	0	Do. Rolled.	18	10	0
Staffordshire Bars..	8	0	0	Faggot..	20	15	0
Sheet, single	9	10	0	Spelter, on the spot..	21	0	0
Double	11	0	0	To arrive	21	10	0
Hoop.	9	0	0	Zinc, in sheets	28	10	0
Rod, round	8	0	0	Copper, Tile	102	10	0
Nail Rod, square ..	9	0	0	Tough Cake	102	10	0
Shipping Iron:—				Sheathing & Bolts, per lb.	—	—	11¾
Staffordshire Bars..	8	0	0	Sheet	—	—	11¾
Sheet, single	9	10	0	Bottoms	—	—	12
Double	11	0	0	Old	—	—	10
Hoop	9	0	0	Yellow Metal	—	—	9¾
Rod, round	8	0	0	Lead, British Pig	22	15	0
Nail Rod, square	9	0	0	Spanish	22	10	0
Iron, Rails, in Wales, cash	6	5	0	Sheet	23	10	0
Do. 6 months	6	10	0	Tin, English Block, nom	138	0	0
In Staffordshire	7	0	0	Bar	139	0	0
Railway Chairs, in Wales	4	5	0	Refined	145	0	0
In Clyde	4	5	0	Foreign Banca	146	0	0
Pig No. 1, in Clyde..	2	12	6	Straits	143	0	0
3-5ths No. 1 and 2-5ths No. 3	2	12	0	Tin Plates, Charcoal, IC, per box	1	13	0
Staffordshire Forge Pig, at the works, L. W., nom	3	15	0	Do. IX	1	19	0
Welsh Forge Pig...	—	—	—	Coke, IC	1	5	6
Acadian Pig, Charcoal	8	15	0	Do. IX	1	11	6
Scotch Pig, No. 1, in London	3	10	0	Canada, Plates, p'r t'n	13	0	0
				Quicksilver, per bottle	7	0	0

There has been a reaction in the Scotch pig-iron, which has fallen to 52s. 3d.

[The above are prices within three per cent discount, the pound being valued at $4.85.

New York Markets

COAL.—Anthracite, from $4.50, $4.75, to $5,

CORDAGE.—Manilla, 8¼c. a 8¾c. per lb.

COTTON.—The sales were more favorable this week, still the prices have somewhat fluctuated. Good ordinary Upland, Florida and Mobile, 9¼c.; Texas, 10c.; Middling fair from 12c. to 13¼c.

COPPER.—There has been a considerable advance in the prices of this metal. Lake Superior ingots at 23c. per lb. for cash; new sheathing, 26c.

FLOUR.—Genesee brands, $5.25 a $6.75; Ohio choice, $5.40 a $6.75; common brands from $4.15 up to $6. Richmond city flour, $6 a $7.

HEMP.—American undressed, $140 a $150; dressed from $190 a $210. Jute, $95 a $90. Italian scarce. Russian clean, $210 a $215. Manilla 6¼c. a 6¾c. per lb.

INDIA-RUBBER.—Para, fine, 57½c. a 60c. per lb.; East India, 37c.

INDIGO.—Bengal, $1 a $1.50 per lb.; Manilla, good to prime, 55c. a $1.10; Guatemala, $1 a $1.15.

IRON.—Anthracite pig, $23 a $24 per tun; Scotch, $23 to $24.50; Swedish bar, ordinary sizes, $35 a $37.50; English refined, $53 a $54.50; English common, $43 a $45. Russian sheet, first quality, 11c. a 11¼c. per lb.; English, single, double and treble, 3⅞c. a 8⅞c.

LEAD.—Galena, $5.80 per 100 lbs.; German and English refined, $5.70; bar, sheet and pipe, from 6¼c. to 7c.

LEATHER.—Oak slaughter, light, 30c. a 35c. per lb.; Oak, heavy, 32c. a 35c.; Oak, crop, 38c. a 40c.; Hemlock, middle, 24c. a 25c.; Hemlock, light, 23c. a 24c.; Hemlock, heavy, 22c. a 23c. Patent enameled, 16c. a 17c. per foot, light. Sheep, morocco finish, $7.50 a $8.50 per dozen. Calf-skins, oak, 62c. a 65c.; Hemlock, 60c. a 65c.; Belting, oak, 32c. a 34c.; Hemlock, 28c. a 31c.

NAILS.—Cut are quiet but steady at 3c. a 3¼c. per lb. American clinch sell in lots, as wanted, at 5c. a 6c.; wrought foreign, 3c. a 3½c.; American horseshoe, 14½c.

OILS.—Linseed, city made, 59c. per gallon; whale, bleached spring, 54c. a 56c.; sperm, crude, $1.22 a $1.27; sperm, unbleached spring, $1.35; lard oil, No. 1 winter, 85c. a 90c.; extra refined rosin, 30c. a 40c.; machinery, 50c. a 100c.; camphene, 45c. a 47c.; coal, refined, from $1.12 a $1.50.

RESIN.—Common, $1.77½ per 310 lbs. bbl. No. 2, &c., $1.80 a $2.12½; No. 1, per 280 lbs. bbl., $2.25 a $3; white, $3.25 a $4.50; pale, $4.50 a $6.25.

SPELTER plates, 5¼c. a 5⅝c. per lb.

STEEL.—English cast, 14c. a 16c. per lb.; German, 7c. a 10c.; American spring, 5c. a 5½c.; American blister, 4¼c. a 5¼c.

TALLOW.—American prime, 10⅛c. to 10¾c. per lb.

TIN.—Banca, 32¾c. a 33c.; Straits, 32c.; plates, $7.50 a $9.87½ per box.

TURPENTINE.—Crude, $3.62½ per 280 lbs.; spirits, turpentine, 44½c. per gallon.

ZINC.—Sheets, 7½c. a 8c. per lb.

The foregoing rates indicate the state of the New York markets up to Aug. 24.

The stock of foreign cannel coal for making gas is very light in our market, as there has been no arrival of cargoes lately from Liverpool. More Virginia cannel should be furnished for this city.

About 2,500 bales of cotton have been sold last week for foreign shipment, at prices favorable for sellers.

There has been a rather buoyant feeling among the flour merchants. Nearly all grades have advanced about 15 cents per bbl., with a good demand. Only 59,662 barrels were exported from the 1st to the 23d of Aug., 1859, against 112,292 in 1858.

The wire factory of Charles Washburn & Sons, of Quinsigamond, Worcester, Mass., consumes about 2,000 tuns of bituminous coal, and 500 of Pictou, for annealing wire, annually.

Scotch pig-iron is in more request this year than it has been for two years past. We have been informed that several American brands which had been sent to our market and had proved as good as the Scotch, thus tending to supersede it, have lately depreciated in quality and cannot be used for fine castings. This must be owing to a want of care in smelting or mixing our ores.

RAILROAD STOCKS.—Missouri 6's, 82⅝ a 83¾; New York Central Railroad, 73⅝ a 73¾; Erie Railroad, 5 a 5½; Hudson River Railroad, 32¾ a 33; Harlem Railroad, 9⅞ a 10; Reading Railroad, 44½ a 44⅝; Michigan Central Railroad, 43¾ a 44; Michigan Southern and Northern Indiana Railroad, 7 a 7½; Michigan Southern Guaranteed, 24½ a 24¾; Panama Railroad, 115⅝ a 115⅞; Illinois Central Railroad, 65 a 65½; Galena and Chicago Railroad, 66⅜ a 66½; Cleveland and Toledo Railroad, 22½ a 22⅝; Chicago and Rock Island Railroad, 64½ a 64¾; Illinois Central Bonds, 88 a 89.

The three steamers of the Collins Company have passed into the possession of the Panama Company and the Pacific Mail Company, forming a united company under the name of the North Atlantic Steamship Company. The *Atlantic*, *Baltic*, and *Adriatic* were sold for $900,000—one-half in cash, and one-half in the stock of the company. Thus it is the Cunarders have driven our best steamships from the European trade. If we are not much mistaken, the *Adriatic* alone cost $900,000.

We are indebted for our home prices to our valuable and able cotemporary, the *Shipping and Commercial List and New York Price Current*, conducted by Autens & Bourne, No. 58 Pine-street.

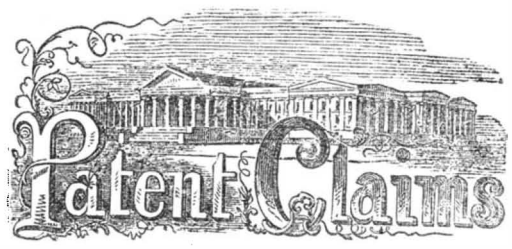
ALBANY LUMBER MARKET, AUG. 24.

For the week the lumber market has presented but few new features worthy of notice. There is a slight improvement in the demand and rather more activity exhibited throughout the district. The stock is very large and steadily accumulating. The assortment is complete, and was never known to be better, if as good. The opportunity now offering for dealers to purchase their fall and winter stocks, if embraced, will result most advantageously. Holders are anxious to realize, and buyers can pick their stock from a well-stocked market, and make their purchases upon better terms than at a latter period. The shipments during the week have been to a fair extent, and distributed pretty equally through the manufacturing districts of New England, Long Island and New Jersey. The receipts have been large, notwithstanding the detention of boats on the Rome level, and those of the ensuing week will be much larger, as all the detained boats will then have reached tide-water. A boat-load of lumber on the canal is now more than double what it was two years ago. They carry from 130,000 to 140,000 feet, as much as an ordinary schooner on the lake, and often as much as any two sail-vessels can carry.

Although the detention of the boats on the canal has been nearly one-half the week, the receipts of boards and scantling exceed those of the corresponding week last year nearly 3,000,000 feet.

We quote prices at the principal yards as follows:—

Pine, clear, per M	$31 00	a	$34 00
Pine, 4th quality	21 00	a	24 00
Pine, select box	19 00	a	20 00
Pine, Chemung box	16 00	a	17 00
Pine, box	12 00	a	15 00
Pine, clear, ⅝	27 00	a	29 00
Pine, 4th quality, ⅝	20 00	a	23 00
Pine, select, ⅝	17 00	a	19 00
Pine, box, ⅝	10 00	a	13 00
Pine piece plank, 11 inch, each	00 24	a	00 27
Pine, piece plank, 10 inch, each	00 20	a	00 24
Pine floor plank, 2d quality	00 19	a	00 20
Pine floor plank, culls	00 11	a	00 15
Spruce boards	00 11	a	00 12½
Spruce floor plank	00 14	a	00 15
Spruce plank, 2 inch, good	00 20	a	00 22
Pine tally boards, good	00 16	a	00 17
Pine tally boards, 2d quality	00 12	a	00 15
Pine tally boards, culls	00 8	a	00 11
Hemlock boards	00 9½	a	00 10¾
Hemlock joist, 3 by 4	00 10½	a	00 11
Hemlock joist, 4 by 6	00 21	a	00 22
Hemlock wall strips, 2 by 4	00 7¾	a	00 8
Clap boards, pine, clear, per M	20 00	a	00 00
Clap boards, pine, 2d quality	15 00	a	17 00
Ash, good	25 00	a	28 00
Ash, 2d rate	15 00	a	18 00
Oak	25 00	a	28 00
Maple joists	16 00	a	17 00
Black walnut, good	40 00	a	45 00
Black walnut, 2d quality	25 00	a	28 00
Black walnut, ⅝-inch	35 00	a	40 00
Sycamore, 1-inch	24 00	a	25 00
Sycamore, ⅝-inch	19 00	a	20 00
Cherry, good	40 00	a	45 00
Cherry, 2d rate	30 00	a	30 00
White wood chair plank	35 00	a	38 00
White wood chair plank, 1-inch	21 00	a	25 00
White wood chair plank, ⅝-inch	15 00	a	17 00
Shingles, 1st quality, shaved, pine	5 00	a	5 50
Shingles, 2d quality, shaved, pine	4 00	a	4 51
Shingles, common, shaved, pine	2 50	a	3 00
Shingles, 1st quality, sawed, pine	0 00	a	3 50
Shingles, 2d quality, sawed, pine	2 75	a	3 00
Shingles, common, sawed, pine	2 00	a	2 50
Shingles, sawed, hemlock	2 00	a	2 20



ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING AUGUST 23, 1859.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

25,168.—Peter Arneson, of Newark, N. J., for an Improvement in Machinery for Forming Hat Bodies:

I claim the arrangement and combination of the adjustable plates, K K, perforated apron, C, case, M, feed rollers, L L, and pickers, D O, substantially as and for the purpose shown and described.

[The object of this invention is to distribute by a very simple means the fur on the usual former or perforated cone in a much more perfect manner than heretofore, so that the hat body when formed will be of a proper varying thickness from its crown to its brim. The invention consists in disposing, by means of a suction blast and adjustable register, the fur on an endless perforated apron or other carrier, in such a manner that the fur will be presented to the picker and through the latter presented to the cone in a volume varying in density, and corresponding to the varying thickness of the hat body to be formed. It also consists in arranging the former or perforated cone relatively with a picker and discharging rollers, so that the former or cone will receive the fur in proper quantities without the aid of deflectors, guides, or any extraneous device whatever.]

25,169.—Albert Betteley, of Boston, Mass., for an Improvement in Shipper-gear for Pulleys:

I claim the combination of a brake-lever, a friction roller, and an independent brake applied and operating together, and with a shipping apparatus, substantially in the manner and for the purpose set forth.

25,170.—R. F. Billings, of Portland, Me., for an Improved Bed-bottom:

I claim the arrangement and combination of the side-rails, A A, boxes, B B, provided with the springs, C, and hinged lids, d d, and slats, D, attached to the lids, d, by the straps, g, substantially as and for the purpose set forth.

[The object of this invention is to obtain a durable elastic bed-bottom, and one that may be readily taken apart, and packed within a small compass for convenience and economy in transportation, and also to facilitate its thorough cleansing when necessary.]

25,171.—A. Bingham, of Talladega, Fla., for an Improved Bed-bottom:

I claim the arrangement and combination of the longitudinal slots, C, rocking foot rail, B, rising and falling hand rail, F, and segment guides, G, as and for the purpose shown and described.

[A series of inclined slats placed longitudinally at suitable distances apart from this bed bottom, and their lower ends are attached to the foot rail and their upper ends are fitted to the head rail, the ends of which are fitted in curved guides attached to the side rails, each slat resting on a spiral shaft, the whole forming a durable and elastic but simple bed bottom.]

25,172.—Seba Bogert, of New York City, for an Improvement in Finger Rings:

I claim an extension or divided finger ring, having its ends provided with a catch, or fastening, substantially as and for the purpose set forth.

[The object of this invention is to obtain a finger-ring capable of being extended or increased in diameter beyond the size required for the portion of the finger on which it is worn, so that the ring may be readily slipped over the joints of the finger in being put on or taken off, and at the same retained by a suitable catch in a distended state while being slipped or passed over the finger.]

25,173.—Charles W. Brown, of Boston, Mass., for an Improvement in Grinding Mills:

I claim, first, Regulating the adjustable stone of a grinding-mill that the stone may have a vertical adjustment, so as to grind finer or coarser at the same time, so that the pressure of the runner, with respect to the stationary stone, will be automatically equalized, and be raised and lowered to free itself of any foreign substance getting between the two stones, by means of levers, I J, and vertical rod, N, toggles, n n, sliding collar, m, and weighted arms, T T, acting upon the movable bearing plate, S, or the equivalents thereof, when the same are arranged and operate in the manner essentially as specified.

Second, I claim the method set forth, for regulating the flow of the grain from the hopper, M, by adjusting the same vertically, in the manner set forth.

Third, I claim the dead-eye, L, arranged within the eye of the upper stone, A, and capable of being raised or depressed with the spindle, G, for the purposes and in the manner specified.

25,174.—C. P. Buckingham, of Mount Vernon, Ohio, for an Improvement in Cut-off Gear for Steam-engines:

I claim the employment of the tripper, N, when constructed and arranged as shown, so as to be adjusted, and to trip both valves, in combination with drops, J, arms, K, and lifters, L, as set forth.

[In this invention an adjustable tripper is arranged in such relation to two spring levers and drops and to a vibrating lifter, that the time when the drops are set free can be arranged by raising or lowering the tripper, so that it strikes the spring arms sooner or later, and when these drops are connected to the stems of two valves which interrupt the communication between the steam-pipe and valve chest of the engine, and which are operated alternately by the same eccentric, the tripper can be so regulated that steam is admitted during the whole or only during a certain portion of the stroke, and if this tripper is connected with the governor, so that it is depressed as the balls of the governor fly out, it will cut off the steam sooner when the engine runs faster, and vice versa, to keep the speed of the engine perfectly uniform.]

25,175.—Wm. Burnet, of New York City, for an Improved Inkstand:

I claim the construction of an adjustable apparatus, made substantially as described, connected with the cover and flexible bottom of an inkstand, so that at whatever height (above the lower orifice of the funnel) the ink on the main reservoir may be, there shall always be a sufficiency and never an overflow in the funnel, on opening the inkstand cover.

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25,176.—J. Carl, of Grenada, Miss., for an Improvement in Grinding-mills:

I claim, first, The arrangement and combination of the pivoted lever, a, shaft, B, stone, C, and screws d, substantially as and for the purpose shown and described.

Second, The employment of a hinged top-bar, g, in combination with the shaft, B, and stones, C D, as and for the purpose shown and described.

[Two stones operating in opposite directions can have their grinding surfaces brought closer together by means of a screw, and they are so arranged that the surface of the upper stone always adapts itself to the surface of the lower stone, and there are other arrangements to make this a good and efficient grinding-mill.]

25,177.—H. M. Coombs and L. W. Nelson, of Portland, Oregon, for an Improved Washing Machine:

We claim the construction of the clothes' cylinder, A, surrounded with air-tubes, having orifices for discharging air into the water, in the manner substantially as set forth, in combination with the drying and washing cylinder, D, and fire chamber, I, all arranged and combined in the manner and for the purposes specified.

[This invention consists in the arrangement of a peculiarly constructed cylinder within a cylindrical chamber surrounded by water, and also in arranging a stove below the arrangement in such a manner that it will answer the two-fold purpose of heating water in the boiler and drying the clothes after they have been washed and rinced in the same machine.]

15,178.—C. W. Crandall, J. H. Crandall, and Hoza N. Hawkins, of Cameron, Ill., for an Improvement in Mole Plows:

I claim the combination of the opening or ditching piece, A C, with the standard, F, and peculiarly formed hinged follower or former, constructed and operating in the manner and for the purposes set forth.

25,179.—E. H. Crane, of Burr Oak, Mich., for a Rat-trap:

I claim the arrangement of the platform, a, spring, c, strap, x, spring, i, and chuck, p, with arms, B B, provided with projections, n n, spring, H, and box, A, provided with hanging-door, D, when the usual parts are combined and operated substantially as and for the purpose specified.

25,180.—H. H. Day, of New York City, for an Improvement in Manufacture of Ribbed Elastic Cloth:

I claim the method, substantially as set forth, of manufacturing ribbed elastic cloth, that is to say, elastic cloth containing strands of rubber, by forming the strands of rubber upon the covering cloth, with which they are to be permanently attached, in contradistinction to forming the strands separately, and afterwards attaching the covering material to them.

I also claim the method, substantially as set forth, of spreading the gum upon the covering cloth, and dividing it into strands at one process, so that the two operations are effected simultaneously at different parts of the same apparatus.

25,181.—Lucius Dimock, of Hebron, Conn., for an Improvement in Machines for Winding Thread:

I claim the arrangement and combination with the guide, A, of two separate and distinct series of grooves, b c, having their channels cut on opposite angles, as and for the purpose shown and described.

[In the ordinary method of winding thread on spools, it is laid spirally from end to end of the spool in opposite directions alternately by means of traveling guides. The guide ordinarily employed to direct the thread on to the spools has cut on its face by means of revolving burrs a series of grooves for the purpose of spreading the thread evenly on the spools, but such grooves are always parallel with the planes of revolution of the spools, and consequently operate in an imperfect manner. This invention consists in a method of cutting the grooves, by which two separate and distinct series of grooves are arranged obliquely in opposite directions to the planes of revolution of the spools, the direction of one series corresponding with the direction which the thread has in one of its spiral layers, and the direction of the other series corresponding with the direction which the thread has in the next layer, and the two series being so arranged that neither interferes with the other's operation.]

25,182.—Joseph Ditto and Henry Van Bergen, of New York City, for an Improvement in Composition for Cement Roofing:

We claim the composition prepared and composed of the materials described, in the proportions set forth, for the purpose of forming cement for roofing purposes.

25,183.—Daniel Dodge, of Keeseville, N. Y., for an Improvement in Nail Machines:

I claim a griper, having a reciprocating movement towards and from forging or pointing machinery, and opening automatically at the outer extremity of its stroke, so as to allow the introduction feeding forward, or removal of the rod, while it is in this position, but holding the rod fast at every other stage of its operation, and while in any other position, substantially at described.

And in combination with a so operating griper, I claim the employment of a gage and a cutter or cutters operating in the described order of succession with respect to each other and the griper.

25,184.—S. W. Eells, of Mansfield, Ohio, for an Improvement in Writing Fluids:

I claim the manner of combining the above materials, so as to prevent the oxydation of the indigo, and the other coloring ingredients, as specified.

25,185.—E. S. Ells, of Troy, N, Y., assignor to C. G. Keeney, of Manchester, Conn., for an Improvement in Knitting Machines:

I claim the combination and arrangement of the lever, e, arm, h, pin, j, and slot, k, with lever, l, detent, n, and springs, o and p, substantially as and for the purposes described.

25,186.—J. J. Essex, of Newport, R. I., for an Improvement in Elastic Bulb Syringes:

I claim so combining and arranging the bulb, air-chamber and delivery valve with each other, and with the flexible suction and delivery tubes, that the air chamber shall be above the delivery valve, and shall remain while in use, upright, or nearly so, and under the control of the hand which grasps and operates the bulb.

25,187.—Albert Fickett, of Rochester, N. Y., for an Improved Belt Fastening:

I claim the combination of the links, l l i, with the rivets, r r r, said links being inserted in the ends of the belt, in the manner and for the purpose substantially as set forth.

25,188.—Elbridge Foster, of Hartford, Conn., for an Improved Easy Chair:

I claim the application and insertion of the quadrant slide into the center of each of the arms or scroll of the side rail, so as to be unseen when the back is up, in the manner as described.

Also, the application of the spring, adjustable and extension back center-leg, in the manner and for the purpose substantially as set forth and described, the whole constituting a new article of manufacture.

25,189.—James F. Gamble, of Concord, Pa., for an Improved Method of Feeding the Saw to the Stuff in Sawing-machines:

I claim moving the saw forward when cutting, whilst the lumber is held stationary, substantially as set forth.

25,190.—Stacy A. Garrison, of Union, N. Y., for an Improved Hub-reamer:

I claim the arrangement and combination of the cutters, c d, and the arbor, A, as and for the purpose shown and described.

[This is a very convenient and simple device, which bores hubs very efficiently.]

25,191.—William Goodale, of Clinton, Mass., for a Machine for Making Paper Bags:

I claim, first, The pasting apparatus, consisting of the roller, G, fitted to work in an opening in the bottom of a paste-box, the spring, H, or its equivalent, and the adjustable stopper, a, all combined to operate substantially as described.

Second, The combination of the continuously-revolving measuring-rollers, I I', and the intermittently-revolving feed-rollers, J J', operating substantially as and for the purpose described.

Third, The drop, N, operating in combination with the cutter, B, and the feed-rollers, substantially as and for the purpose specified.

Fourth, Folding the paper around a plate, Q, or flat piece of any material narrower than the bag itself, or of the same width as but shorter than the bag itself, substantially as specified.

Fifth, The folders, R R', applied and operating in combination with the inclined planes, l l', at the sides of the folding table, C, substantially as and for the purpose set forth.

Sixth, The combination with the folding table and with a plate, Q, narrower than the bag, to fold the bag upon, of one or more movable inclined planes, l', and creasing-blades, U, operating substantially as described.

Seventh, The drop, Z, applied and operating substantially as and for the purpose described.

Eighth, The bar, 21, applied to the vibrating roller-frame, and operating in combination with the knock-off, n, substantially as and for the purpose set forth.

25,192.—Charles Goodyear, of New Haven, Conn., for an Improvement in Porous-napped Rubber Fabrics:

I claim a new porous manufacture or fabric, composed of a woven or other cloth, or equivalent therefor, and india-rubber or allied gum, rendered pervious to air and impervious to water, substantially as described, and with a face of flocks, clippings, or shearings, of woolen or other fibers, or equivalents therefor, substantially as and for the purpose described.

25,193.—Rensselaer D. Granger, of Philadelphia, Pa., for an Improvement in Cooking-stoves:

I claim placing across the upper flue of a cooking-stove a hollow box-formed partition communicating with the external air, the said partition having two openings, arranged in respect to the boiler-holes in the top plate, as set forth, and the said openings having their inner surfaces perforated as and for the purpose specified.

25,194.—John S. Hawkins and Rezin Hawkins, of Greenfield, Ind., for an Improvement in Harvesters:

We claim the arrangement of the main frame and team-shaft, in combination with the adjustable frame, L, and hinged shoe or cutting apparatus, T, constructed and operated in the manner substantially as described for the purpose specified.

25,195.—Thomas R. Hopkins, of Petersburg, Va. (assignor to himself and R. E. Robinson, of same place), for an Improvement in Screw-presses:

I claim the use, in combination with a power-screw of a press, or other machine, of two revolving nuts, F F, which are fitted to gear into the thread of said screw, and so arranged and operated upon, in order to give motion to the screw, that the upper one remains stationary while the lower one revolves, and vice versa, substantially as and for the purposes set forth.

[This invention consists in giving the follower of a press a progressive upward or downward motion, by means of two sets of cams, with friction rollers between them. The cams are arranged on disks, which have spur-teeth on their circumferences; the upper disk has one more tooth than the lower one. Into these teeth a long pinion gears, said pinion being moved slowly by a long lever, and as it turns, the upper disk gradually gains on the lower one, and, consequently, with the aid of the friction rollers, rises and forces up the follower with a powerful pressure, the gradual elevation being retained at all times by reason of the cams of the lower disk which has no vertical movement, acting antagonistic to the cams of the upper disk which both revolves and moves vertically up and down. This press cannot fail to operate well; and as it combines two of the most powerful and effective elements of mechanics for giving motion and power, we think it is just the thing for our southern cotton and tobacco planters. An engraving will be presented in our columns shortly.]

25,196.—Robert W. Hill, of Naugatuck, Conn., for an Improvement in Cooking Apparatus:

I claim the portable cooking or heating apparatus described, composed of the hot-air chamber, A, and fire-pit, B, when provided with ports, C, furnished with registers, with the partition, c, and draught-apertures, a, the whole being constructed and arranged as specified.

25,197.—Hermann Hirsch, of Berlin, Prussia, for an Improved Marine-propeller:

I claim the peculiar form and construction, substantially as described, of a propeller, whereby the centrifugal force obtained is made to co-operate with and increase the effect of the same.

25,198.—Hermann Hirsch, of Berlin, Prussia, for an Improvement in the Construction of Ships:

I claim the form and construction, substantially as set forth, of the hull of ships or vessels, whereby the possibility of breakage of keel is removed, and a normal form, giving a maximum of steadiness, without retardation of velocity, is imparted to the bottom.

25,199.—Richard M. Hoe, of New York City, for an Improvement in Feeding Paper to Printing-presses:

I claim the combination of the feeding mechanism, cutting apparatus and the printing-machine, or their equivalents, in the said combination for feeding the paper from a roll to a printing-machine, and cutting or partially cutting it into sheets, as it passes along to be printed, as set forth.

I also claim making the cutter so as to leave the several sheets united in certain places, substantially as described, in combination with the conducting tapes, as described, or the equivalents thereof, so that the conducting tapes may pass around the cutter-cylinder as set forth.

And I also claim, in combination with the cutter-cylinder and the grooved cylinders, substantially as specified, or the equivalents thereof, the employment of the two pressure-rollers, or their equivalents, as described, for keeping the sheet distended.

25,200.—Charles H. Hunter, of Shelbyville, Ind., for an Improvement in Machines for Weighing Grain:

I claim the combination of the scale-beam or lever, g, with the bag-holder, H, secured to one end, and the standard, c e, with rack and pinion for elevating or depressing the scale-beam, when the whole is constructed and arranged substantially as described for the purposes set forth.

25,201.—Obed Hussey, of Baltimore, Md., for an Improvement in Harvesters:

I claim, first, The combination of the main ground-wheel seat and platform, when hinged to the main frame substantially as described.

I also claim the raising and the lowering of the entire frame, finger bar, and outside divider upon the two ground supports, in a horizontal position, by means of a lever and its connections therewith, operated by the driver from his seat, substantially as described and for the purpose set forth.

25,202.—Jacob Jenkins, of Lynn, Mass., for an Improved Mechanism for Protecting the Upper Part of a Boot or Shoe while Applying the Sole:

I claim the described arrangement of a shoe-jack (or mechanism for supporting the toe and heel parts of a boot or shoe), a guard or protector constructed essentially in the manner as set forth, the same being made to encompass the upper of a boot or shoe, or so much of it as extends above the bottom surface of the last, and a clamping contrivance for adjusting the protector to the contour of the shoe, the whole being made to operate together as and for the purpose set forth.

I also claim the described application and arrangement of an adjustable guard to the protector, whereby the fitting of the outer sole to the insole and upper is not only greatly facilitated, but is rendered certain of being fixed in its true and proper position.

25,203.—Walter W. Kelly, of Reedtown, Ohio, for an Improvement in Scales:

I claim the adjustable rack, G, and platform, H, constructed and arranged as described, in combination with the center-piece, H', upon which the rack and platform are placed, so that either one can be used at pleasure in the manner specified.

25,204.—W. R. Landfear, of Hartford, Conn., for an Improved Pegging-machine:

I claim, first, The employment, in combination with the bar, A, of the vertically and laterally-moving box, C, having a plate, D, awl, h, punch, i, and inclined face, j, arranged substantially as described and shown, so that on the descent of the plate, D, the awl will enter the sole, and the inclined face, j, will, while the awl remains in the leather, shove the bar, A, along laterally, thus ensuring certainty and regularity of feed; and on the elevation of the plate, D, the box, C, will be moved laterally by the spring, l, the awl will be carried over the point where a new hole is to be made, and the punch brought over the previously-made peg-hole in readiness to drive home the peg on the next descent of the plate, D.

Second, The combination with the vertically and horizontally moving box C, of the spring, l, for giving a lateral movement to said box, and the adjusting screw, m, for regulating the spaces between the peg holes, as shown and described.

Third, The arrangement and combination with the bar, A, of the adjustable elastic plate, E, against which the peg block is pressed, said plate being adjusted by means of the screw, p, to suit any size of pegs, as herein shown and described.

25,205.—D. L. Long, of Dayton, Ohio, for an Improvement in Sleeping Berths for Railroad Cars:

I claim the arrangement and combination of the jointed supporters, i, i', i'', i''', m, n, r, and hinged seat and back, A, with the folding berth, g, g', screen, k, and rest, l, all arranged and operating, so as to form two sleeping berths, substantially as described.

25,206.—Eugene Martin, of Waterbury, Conn., for an Improvement in Alloys:

I claim the process or mode of procedure, substantially such as herein described, as applied to the ingredients, such as described, and for the purpose specified.

25,207.—John M. May, of Janesville, Wis., for an Improvement in Pumps:

I claim cylinder, B, in combination with part, A, when constructed, arranged, and operated with piston, C, and pipe, E, substantially as described, and for the purpose set forth.

I also claim the screw, D, when used for the purposes of fastening and unfastening the stationary part of the pump in the well, or reservoir, to any suitable substance, substantially as, and for the purposes described.

I also claim set-screw, N, in combination with the notch, O, or projection, P, or their equivalents, to form a catch or wrench, for turning the screw, D, and pump nearly in the path of a horizontal circle, in fastening and unfastening the stationary part of the pump in the well, or reservoir, substantially as described: the set-screw, N, also serving to gage the descent of the piston and to protect the valves from injury, as set forth.

I also claim the devices consisting of springs, G, G, segment, J, and lever, H, when connected together substantially as described, and for the purposes set forth.

25,208.—John M. May, of Janesville, Wis., for an Improvement in Pumps:

I claim the device for connecting together the cylinders and regulating the stroke of the pump, in combination with the point or spike, I, or its equivalent, when used in open wells, and claim said device in combination with rod, H, when used in drilled wells, substantially as, and for the purposes set forth.

I also claim the collar, F, and springs, g, g, g, g, g, g, g, g, g, when used in combination with the pump, or with the eduction-pipe, and arranged substantially as shown.

25,209.—Hippolyte Monier, of Paris, France, for an Improvement in Argand Gas-burners:

I claim the construction of the Argand burner, with its grate, a, and external tube, b, of clay, porcelain, or other incorrodible refractory non-conducting material, and with the inner tube and stem of metal—the several parts being combined substantially as described.

25,210.—Richard Montgomery, of New York, N. Y., for an Improvement in Corrugated Iron Bridges:

I claim, first, The combination of the corrugated arch, A, B, with the corrugated arch, M, N, constructed and arranged in relation to each other, substantially as described and shown.

Second, The combination of the peculiarly-formed blocks, C, and bed-plates, F, with the abutment ends of the arches, A, B, and M, N, substantially as, and for the purposes set forth.

Third, The combination of the blocks, D, and bottom-plates, G, with the cross-rails, K, L, and arches, A, B, and M, N, substantially as, and for the purposes described.

25,211.—Benjamin F. Moore, of New York, N. Y., for an Improvement in Ladies' Bustles:

I claim an inflated bustle for ladies' dresses, formed with the projecting points or scollops, d, d, in the manner and for the purposes specified.

25,212.—Daniel Murray, of Fairfield, Conn., for an Improvement in the Mode of Measuring Grain:

I claim the arrangement of the arms, a, and h, in combination with the sides, b, and f, constructed and operating as described, and for the purposes set forth.

25,213.—William Murray, of Baltimore, Md., for an Improvement in Stamping Machines for Crushing Ores, &c.:

I claim, first, The combination of two or more stampers arranged on the same radial line with two or more semi-circular, inclined, revolving, lifting, and dropping cams, which move together, and with a central driving shaft, substantially as and for the purposes set forth.

Second, Providing the semi-circular lifting and dropping cams with a vertical joint about midway between their terminating ends, and with an oblong vertical slot at their rear or highest ends, and attaching said ends, by means of a set screw, or its equivalent, to the frame of the cams, so that the inclination of said cams may be adjusted to lift the stampers to a greater or less hight, according to the force required to perform the operation of stamping, substantially as and for the purposes set forth.

[This arrangement of two or more stampers on the same radial line with two or more semi-circular horizontally-revolving cams, renders the machine capable of doing double the amount of work in a given time that is performed by ordinary single-cam stamping machines, without the necessity of enlarging the size of the machine or employing more than one driving shaft. And the arrangement of the cams so as to be adjustable provides for the graduation of the force of the blow given by the stampers, and thus the machine can be adapted readily for stamping ore, or pounding hominy, rice and other substances of various nature. This is a good improvement.]

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25,214.—Richard H. Osgood, of Columbus, Ohio, for an Improved Reciprocating Saw:

I claim providing the upperedges of saw teeth with notches, f f, fig. 1, substantially as described and represented, for the purpose of assisting to clear the kerf of sawdust.

25,215.—John L. Pott, of Pottsville, Pa., for an Improvement in Hoisting Apparatus:

I claim the inclined drum, M, revolving in a plane parallel, or nearly parallel to the lines of hoisting rope, in combination with the guide pulleys, Q Q, on the cross-head, R, the latter being operated by the shaft or the drum, through the medium of the screw, K, or its equivalent, substantially as, and for the purpose set forth.

25,216.—John B. Quigley, of Trenton, N. J., for an Improvement in Tapping Water Mains:

I claim the employment of the pivoted standards, B, jaws, C adjustable beam D, adjustable swivel, F, chain, G, vertical sliding-piece, E, and ferule, K, when the above parts are arranged and combined as shown and described.

25,217.—Thomas Robjohn, of New York, N. Y., for an Improved Inkstand:

I claim the arrangement and combination of the ring, D, cover, D′, arm, e, slatted projection, E, and diaphragm, G, so that by pressing down ring D, the cover will open and the ink rise; and by eleasing the ring, the ink will fall, and the cover, D′ will close, as and for the purposos shown and described.

[The nature of this invention consists in applying the principle of action of the elastic diaphragm covered under a patent dated August 22, 1857, to serve the double purpose of forcing the ink into the fountain by downward pressure, and to act as a spring upon a lever, in order to keep the cover of the fountain always closed down tightly when the pressure is removed.]

25,218.—Charles W. Russell, of Philadelphia, Pa., for an Improved Method of Shaping Bonnets:

I claim the described method of shaping bonnets, &c., by means of a core, or its equivalent, which is wound over the several parts of the bonnet, and which is retained in position, by hooks, a, and d, or their equivalents, substantially as specified.

25,219.—Charles W. Russell, of Phiadelphia, Pa., for an Improved Machine for Pressing Bonnets:

I claim the arrangement of the adjustable roller, l, or its equivalent in such relation to the chain or rope, which connects the treadle with the press-lever, D. that the direction in which the pressing-iron acts can be controlled, substantially in the manner, and for the purpose described.

25,220.—Augustin P. Samuel, of New York, N. Y., for an Improvement in Rotary Engines:

I claim the method of governing and working the pistons, C D, by connecting their piston-rods, K K, through the roller holders, L L, and rollers, M M, directly with the eccentrated curve, F, substantially as and for the purposes set forth.

I also claim the combination and arrangement, substantially as described, of the valves, a, and b, with and within the movable pistons, C, D, whereby such valves, a, b, are opened by the first motion of the piston-rods, K K, and before any motion is given the pistons, C D, so that a passage is given to the steam within such pistons, and the steam admitted on both sides thereof, for the purpose of producing an equilibrium of pressure on each side of such pistons before they are put in motion.

I claim also the construction and arrangement, as above-descoibed, of the packing rings, r, s, acting against each other by inclined surfaces; the outer ring, s, being conical, or tapering, or both sides, and the inner ring, r, being tapering on one side only towards the ring, s, and the inner ring acting against the other by means of the spring, z, or its equivalent, expanding it outward against the cylinder, and inward against the piston, for the purposes specified.

25,221.—Hezekiah B. Smith, of Lowell, Mass., for an Improved Mortising Machine:

I claim the relative arrangement of the fulcrum, D, lever, F, connecting-rod, G, and table, R, with each other, in the manner described, when combined with power mortising machines, for the purposes set forth.

25,222.—George S. G. Spence, of Boston, Mass., for an Improvement in Stoves:

I claim the use of the conical inverted cup, B, combined with the chain, f, or its equivalent, in the manner, and for the purpose set forth.

I also claim the combination of the air deflector with the fire-place door register, and so as to operate therewith, and deflect the entering currents of air upon or toward the ignited surface of the fuel, as described.

25,223.—Orange N. Stoddard, of Oxford, Ohio, for an Improvement in Sewing Machines:

I claim the yielding metallic loop-check, B, b, operating in combination with a grooved hook, A, a, or its described equivalent, in the manner and for the purpose set forth.

25,224.—Zuriel Swope, of Lancaster, Pa., for an Animal Trap:

I claim, first, The sinking bottom, N, constructed as described, for closing the trap, when acting in combination with the spring, f, and bait lever, M, substantially as already specified.

Second, I claim the counterbalance chamber, H, constructed as described, and operating for the purpose of resetting the trap, as already set forth.

25,225.—H. K. Symmes, of Newton, Mass., for an Improvement in Gas Retorts:

I claim the arrangement of the removable flues, D, and valves, E, in combination with retorts of double length, substantially as, and for the purpose set forth.

[This invention consists in arranging the lid of a retort with a horizontal tube or flue in such a manner that the flue can easily be removed and cleaned independent from the retort, and it further consists in arranging it with a socket to fit to a flange which is cast or otherwise rigidly attached to the lower end of the stand pipe, so that the lid can be attached to the body of a retort, dispensing with the mouth-piece altogether; and that the gas emanating from the material in the front part of the retort has to pass back over the hotter portion of the coke in order to reach the opening in the flue through which it passes to the stand pipe, and the stand pipe is secured to the body of the retort so that its lower end is open when the door is taken off. If this arrangement be applied to retorts of double length the openings of the flues are closed by valves which are operated from the outside, and the two ends of the retorts are closed at different times, so that one end is hot while the other is charged, and by closing the flue on this end, the gas arising from the fresh charge can be forced to pass through the whole length of the retort to the flue on the opposite end.]

25,226.—Charles Taylor, of Little Falls, N. Y., for a Ticket-holder for Railroads, &c.:

I claim the eye, E, spring clasp, C, and spring hook, B, in combination with the link, D, or its equivalent, for the purpose described.

25,227.—Stephen R. Weeden, of Providence, R. I., for an Improvement in Preparation of Candle-wicks:

I claim a plaited or braided candle-wick, e, saturated with a solution of acetate of lead, or other substance, to aid combustion, and coated with a silicate, as, and for the purpose set forth.

[The object of this invention is to provide candles that are made of tallow and other stock that fuses or melts at a comparatively low temperature with a wick that will bend and have its end brought in contact with the air, and be consumed as the candle burns down, without guttering the candle, or causing it to burn badly. Candles made of stock that melts at a comparatively high temperature, such as wax, stearine, spe maceti, and the like, are provided with such wicks as do not melt or gutter the harder stock by their bending. This invention consists in the employment of a braided or plaited cotton-wick saturated with acetate of lead, and then coated with an alkaline silicate to make the wick stiff, so that it will not bend toocreadily, and at the same time bend at a sufficient hight above the candle to consume but not to gutter the candle.]

25,228.—J. W. Wetmore, of Erie, Pa., for an Improvement in Railroad Chairs:

I claim the T lip, or jaw, (as at k, l, m, or k,‴ l,‴ m,‴) notching the web of the rail, as at e, e, and through these notches, having the bottom of the jaw pass down, and riveted or keyed under the base, g, h.

25,229.—Ira Wisel, of Newbury, Minn., for an Improvement in Water Wheels:

I claim the peculiar form of the buckets, in combination with the rest of the wheel.

25,230.—F. L. Buel (assignor to C. G. Keeney), of Manchester, Conn., for an Improvement in Knitting Machines:

I claim attaching the mechanical device, above set forth, to a knitting machine, namely, by the thread guide, b, lever, c, e, and arm, i, substantially in the manner, and for the purpose described.

I also claim the arrangement of the lever, k, connections, m, n, frame, h, and arm, i, substantially as described, and for the purpose set forth.

25,231.—Jonas Hinkley (assignor to himself and Frederick A. Wildman), of Clarksfield, Ohio, for an Improvement in Sewing Machines:

I claim, first, The combination of the looper, H, and receiving spring hook, J, when arranged so as to operate in the manner and for the purpose set forth.

Second, The combination of the deflecting hook, G, the looper, H, and the receiving hook, J, essentially as specified.

Third, The lifting finger, K, or its equivalent, operating substantially as set forth.

Fourth, The combination of the lifting finger, K, with the looper, H, and receiving hook, J, substantially as described.

Fifth, The combination of the lifting finger, the deflecting hook, G, the looper and the receiving hook, arranged and perating substantially as described.

Sixth, The combination of the arm, D5, link, D6, and lifting bar, D4, with the vibrating bar, D3, and feeding hand, D7, for the purpose described.

25,232.—Thomas R. Hopkins (assignor to himself and R. E. Robinson), of Petersburgh, Va., for an Improvement in Cam Presses:

I claim operating a press followeror other part of a machine which is required to give a gradual pressure, by means of the combined agency of two differentially toothed disks, D, D′, which revolve at unequal speeds, two sets of reverse acting cams, b, g, and intermediate friction rollers, E, or their equivalents, substantially as described.

25,233.—William Linton (assignor to himself and John Jones), of Baltimore, Md., for an Improvement in Machinery for Making Clay Pipe:

I claim the two-sized permanent core or mandrel, in combination with the fixed die, A, and adjustable jaws, C, D, constructed, arranged, and operating in the manner described, for the purpose specified.

25,234.—E. T. Steen, of San Francisco, Cal., assignor to himself and B. S. Nichols, of Sacramento, Cal., for an Improvement in Quartz Mills:

I claim the employment of stampers, E E′, when the same are operated by means of steam cylinders, H H′, which communicate by the cross-passage, e e′, the change of steam being effected by valve pistons, J J′, operating on a working beam, L, and operated by the pistons, G G′, the whole being arranged and combined substantially in the manner described.

[This invention relates to that class of mills in which the stampers are operated by steam, and it consists in arranging two stampers in a double cylinder in such a manner that by the action of the upper ends of the stems of the stampers—which at the same time form steam pistons—as they strike against the valve pistons, the steam is changed and conducted to the cylinders by cross passages in such a manner that when the steam is admitted to one cylinder on the top and exhausts from the bottom, it enters the other at the bottom and exhausts at the top, and the change of steam is effected by means of two valve pistons which are connected by a rocking lever from which an arm extends down to the valve, so that when one of the main pistons rises and strikes against the valve piston so as to raise it, the valve is thrown the full distance, and the full power of the steam is admitted to the cylinders at once.]

25,235.—Bernard Louth (assignor to Jones & Louth), of Pittsburg, Pa., for an Improvement in the Manufacture of Iron:

I claim a new article of manufacture made by rolling iron or steel in a cold state for hardening and adding strength to it, without injury to its fiber, and at the same time reducing it in size, as set forth.

RE-ISSUES.

H. W. Collender, of New York City, for an Improvement in Billiard-table Cushions. Patented Dec. 8, 1857:

I claim composing cushions for billiard-tables, with a body or back of what is known as the soft compound of vulcanizable india-rubber, or allied gum, in combination with a facing of india-rubber, or allied gum, rendered less compressible by fibrous matter or the equivalent thereof, substantially as described.

C. A. McEvoy, of Richmond, Va., for an Improvement in Railroad Station Indicators. Patented Nov. 20, 1855:

I claim presenting a movable sign or symbol to passengers of a railroad car, so that both sides of said sign shall be visible, and utilized as annunciators by passing each sign in turn through an opening of the case, by the revolving of the drum to which the said signs areattached,

James Powell, of Cincinnati, Ohio, for an Improvement in Faucets. Patented March 22, 1859; re-issued July 5, 1859; again re-issued Aug. 23, 1859:

I claim, first, The valve-stem, H, formed with projecting flanges, J and S′, when confined to a rectilinear path and operated by a cam or eccentric, which engages with it at two opposite points, in the manner and for the purpose set forth.

Second, The described arrangement and combination of the slotted head, I i, pivot, c, socket, E, and cam, F, operating in the manner set forth to prevent lateral motion of the valve stem.

ADDITIONAL IMPROVEMENTS.

Moses Bales, of Big Plain, Ohio, for an Improvement in Mole Plows. Patented Feb. 15, 1859:

I claim the employment of the cap, d, in combination with the mole E, constructed and arranged substantially as and for the purposes set forth.

L. P. Harris, of Mansfield, Ohio, for an Improvement in Apparatus for Evaporating Saccharine Juices. Patented January 18, 1859:

I claim the application of partial transverse or oblique partitions to evaporating pans, for the purpose of preventing a continuous transverse channel, when the said partitions shall be arranged substantially in the manner as fully set forth and described.

DESIGNS.

James Bogle, of West Newton, Mass., assignor to himself and Daniel Bogle, of Dover, N. H., for Designs for Floor Oilcloth. (Two Cases.)

Henry Hebbard, of New York City, for Design for Spoon or Fork Handles:

Francis M. Strong and Thos. Ross, of Brandon, Vt., for Design for Scales.

NOTE.—In another column is an article complaining of the delay at the Patent Office in the examination of certain classes of inventions. Those remarks will not justly apply to the entire examining-corps; and since the article was penned, our attention has been called to the preceding list of claims, in which we notice the issue of a number of patents in cases which have been before the Office for some time, so we are now in hopes that we shall not be under the necessity of again protesting in behalf of inventors at the delay under which too many of them have been obliged for months past to suffer. While a few of our clients are lamenting at the delay to which they are subjected, others write us by nearly every mail acknowledging the prompt and efficient manner in which their cases have been prosecuted; and among our own patrons, we recognize in the above short list of patents the names of TWENTY-SIX whose papers were prepared, and their applications conducted to a successful termination, through the Home Office of the SCIENTIFIC AMERICAN, exclusive of a number which were prepared at our Branch Office, corner F and Seventh-streets, Washington.—EDS.

Hints to Inventors and Patentees.

INVENTORS who have made improvements upon which they desire to procure Letters Patent, will do well to bear in mind that the Proprietors of the SCIENTIFIC AMERICAN have had upwards of fourteen years' experience in the examination of inventions, and during this time have unquestionably had more cases brought under their immediate notice than any other Patent Agency in the United States. It would be absurd to suppose that this extended experience did not afford them unparalleled facilities for the rapid and successful prosecution of this department of professional business. Messrs. MUNN & Co. have made thousands of personal examinations at the United States Patent Office into the novelty of inventions, and are familiar with the law, the rules and the regulations that govern the examination of cases, and are having daily intercourse with the Honorable Commissioner of Patents and the Examiners. Messrs. MUNN & Co. have, during the last few years, successfully prosecuted hundreds of rejected cases, not for their own clients merely, but for agents of limited experience, whose offices are remote from that great storehouse of American genius, the United States Patent Office. They venture the assertion that, possessing such advantages and facilities as they do, no other Patent Agency in the United States can offer equal inducements to the worthy inventors of this country. In proof of the unparalleled amount of business transacted through the Scientific American Patent Agency, it is only necessary to refer to the letter of the Hon. Charles Mason, the late respected Commissioner of Patents, also to the letter of the Hon. Joseph Holt, now Postmaster-General, who also filled the office of Commissioner of Patents with great credit (both of these letters are published below), and to the still more significant fact that since the 1st of January last—a space of only eight months—we have secured SEVEN HUNDRED AND FORTY-SIX Letters Patent for inventors whose cases were prepared and prosecuted through the Scientific American Patent Office.

Notwithstanding the multiplicity of Patent Agents in the United States, the business of Messrs. MUNN & Co. is steadily on the increase. At no former period has their professional practice been so extensive as at present, which fact indicates that inventors throughout the country have the most perfect confidence in their integrity and mode of transacting this class of business. Their experience covers the most remarkable years of inventive progress; their knowledge could not be purchased by money, any more than an abstruse science could be acquired without laborious study and many experiments. They have facilities within their power by which the entire business of the United States Patent Office could be successfully carried on through their Agency alone. If cases are rejected, they are rigorously investigated. Appeals, interferences, and extensions are also conducted with the greatest care. In fact, every department of the business connected with the Patent Office receives their attention.

If an inventor wishes to procure patents in Great Britain, France, Belgium, Austria, Russia, Prussia, Spain, Holland, or any other foreign country where patent laws exist, Messrs. MUNN & Co., through their old established agencies in London, Paris, and Brussels, can attend to it with great dispatch, and will furnish all needful information upon application, either in person at their offices in New York and Washington, or by letter. Inventors should remember that MUNN & Co's office in Washington is not a mere "Agency," in which inventions are exposed to the view of outside parties, but it is a Branch Establishment managed by Messrs. MUNN & Co., and their confidential clerks.

Messrs. MUNN & Co. wish it to be distinctly understood that they neither buy nor sell patents. They regard it as inconsistent with a proper management of the interests and claims of inventors, to participate in the least apparent speculation in the rights of patentees. They would also advise patentees to be extremely cautious into whose hands they entrust the power to dispose of their inventions. Nearly fifteen years' observation has convinced us that that the selling of patents cannot be conducted by the same parties who solicit them for others, without causing distrust.

Inventors who wish to personally consult with Messrs. MUNN & Co. can freely do so, and receive promptly all needful advice, free of charge, and their letters will be treated as confiential.

We commend to the perusal of all who are interested in the procuration of Letters Patent, the following testimonial-letters from Hon. Judge Mason and Hon. Joseph Holt; the former is now a candidate

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for the bench of the Supreme Court of the State of Iowa, and the latter is the Postmaster-General of the United States:

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours, very truly, CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements. Very respectfully, Your obedient servant, J. HOLT.

PRINCIPAL OFFICE—37 Park-row, New York.

BRANCH OFFICE—Corner of F and Seventh-streets, Washington, D. C., opposite the United States Patent Office.

FOREIGN OFFICES—London, 66 Chancery-lane; Paris, 29 Boulevard St. Martin: Brussels, 26 Rue des Eperonniers.

A PAMPHLET AND CIRCULAR OF ADVICE, "How to Procure American and Foreign Patents," sent free on application. All communications considered confidential, and should be addressed to

MUNN & CO., No. 37 Park-row, New York.

REJECTED CASES, also applications for the Extension of Patents, receive special attention. In this class of cases, MUNN & Co. have had great success.

W. A. S., of Ark.—We regret we must decline publishing your second letter. It contains some thoughts of general interest to the public. There is, however, a mechanical obstacle to its publication. The handwriting is exceedingly minute (almost requiring a microscope for its perusal); it is also otherwise very illegible, and the matter is written on both sides of the paper. This last fault, though common to persons unaccustomed to writing for the press, gives great trouble to the printer and is almost always fatal to the author, unless the writing is exceedingly distinct, which is far from being the case in the present instance.

G. O. K., of Vt.—The best way for you to procure a second-hand steam-engine will be to advertise for it in the SCIENTIFIC AMERICAN. You will find our terms on another page.

W. P., of Ohio.—In the answer to you on page 126 of our present volume, the word "feet" should have read "inches." A tube 1,728 inches high and of one square inch area contains a cubic foot of water which weighs 62½ pounds water, and exerts this amount of pressure on its base. A similar tube of 1,692 inches (141 feet) high contains about 61 pounds of water; a round tube one inch in diameter, and 178 feethigh, contains nearly the same quantity of water, and exerts a like intense pressure on its base. As has been inferred with good judgment, "it is not easy to avoid errors sometimes taking place, in answering so many correspondents, and using so many mixed terms and quantities."

W. M. F., of Pa.—Wagon brakes have been patented to accomplish what you desire. If you have anything new in this department of invention you are entitled to a patent for it. Send us a description of it for examination.

C. R., of Tenn.—If some nitrate of silver is added to printers' ink, it will make indelible stencil ink.

J. L. M., of Ind.—On page 52 of the present volume of the SCIENTIFIC AMERICAN, you will find instructions for plating on iron. We know of no such book as you describe suitable to every mechanical pursuit.

E. H. B., of Mass.—You can make black impression paper with glycerine and lampblack, also with fresh butter and lampblack; dry as well as possible after application.

T. McC., of N. Y.—You can easily calculate the power of a hydraulic press by multiplying the pressure on the square inch into the water area of the ram in square inches, and by the speed, in feet, per minute of the piston. As your ram has an area of 14.75 square inches and a pressure of from 1 to 30 lbs. on the square inch, if it moves at the rate of two feet per minute its power will be one-sixth of a horse—5126.10 lbs. lifted one foot in one minute. Consult a work on horology about pendulums.

E. B., of S. C.—Your idea of placing a perforated diaphragm at the bottom of the steam-chamber to prevent water being carried up into it is an old one, and so is the surface well for collecting and conveying away the foam. We do not very well understand your bulk-head, owing to the imperfection of your drawing, but have seen something very much like it. We have sent to your address one of our pamphlets of information.

R. D., of C. W.—We thank you for proposing to get us up a club of subscribers. We are now electrotyping our numbers each week, and can therefore supply back numbers at all times. Plaster-of-Paris can hold boiling water without being much affected by it. A cement of plaster-of-Paris and fine white sand, in equal parts, mixed up with white lead paint, will answer well, we believe, for stopping the leaks in your tank.

D. P. of Pa.—We do not know of any substance suitable for cleaning fly specks from the feathers of stuffed birds. You had better consult some taxidermist in Philadelphia.

H. M. S., of Mich.—The coal of a wood fire burned in the open air is different from charcoal burned in a pit. The former contains hydrogen, the latter none. Hydraulic cement sets in a very few minutes after it is laid. Platinum is the most expansive metal by heat, and wrought expands more than cast iron. Allow dull files to lay in diluted sulphuric acid until they are bit deep enough. We cannot specify the time that is required.

J. R. B., of Ind.—We cannot think that a few shot would prevent molasses running out of a barrel without the barrel itself was very tight. Lyell's "Manuel and Elements of Geology," published by D. Appleton & Co., of this city, will suit you best.

C. L. H., of Vt.—If you take the trouble to figure out the cost of cigar-making, as stated in our article, you will see that our figuring is not so tall as you suppose.

J. M. C., of Iowa.—Boiled linseed oil will keep polished tools from rusting if it is allowed to dry on them. Common sperm oil will prevent them from rusting for a short period. A coat of copal varnish is frequently applied to polished tools exposed to the weather.

H. W. W., of Ill.—A more regular motion is produced by cutting off the steam before the end of the stroke than in carrying full pressure the whole length.

W. S. G., of Ill.—We are not acquainted with the composition of the cement to which you refer. A mixture of india-rubber and shell-lac varnish makes a very adhesive leather cement. A strong solution of common isinglass, with a little diluted alcohol added to it, makes an excellent cement for leather.

M. B., of Mass.—You will find information on the art of lithography by reference to Ure's dictionary. There is no distinct work on this subject.

B. C., of Pa.—Superheated steam is gradually coming into more extended use in England, but is making no progress in this country. It has been found most advantageous not to use it too highly heated, as it uses up too much lubricating material when very highly dried.

M. H., of Pa.—We refer you to articles on pages 169 and 204 of Vol. XIV. of the SCIENTIFIC AMERICAN; they contain full information on the subject of balancing saws.

J. O. M., of N. Y.—So far as we know, your improvement in casting cannon of the two metals specified in your letter is new and useful; and it appears to us that, by casting the most fractious on the top of the least fractious metal, as proposed, you will accomplish the desired result.

W. J. P., of Vt.—The hone side of a razor strap is made with fine emery laid on with glue; the polishing side is made of calcined tin or colcothar, but if you cannot get these use black-lead and a little grease. The finishing side is simply buff leather.

C. M. E., of Pa.—There is no patent in existence which covers the use of compressed air as a motor. Any person may use compressed air in the United States for moving cars, as it is public property.

C. A. F., of Mo.—The coating for iron to which you refer is sillicate of soda, and will not answer for iron boilers to prevent corrosion. Muspratt's Chemistry is sold by Russell & Bros., 290 Broadway, New York. Your subscription expires Jan. 1.

E. B., of S. C.—You omitted to sign your name to your letter of inquiry about the double boat, but there being evidence of good faith on your part we reply that it is an old idea, and we cannot advise you to apply for a patent on it. Your money would be thrown away upon the government and the agent.

Turner, Maine.—A correspondent from this place seeks information from us, and is disappointed, doubtless, in not receiving an answer. The reason is he forgot to sign his name to his letter.

J. H. R., of Mass.—By all means have your well covered, as it will then be protected from dust and dirt.

W. B. G., of N. Y.—Under some conditions, we have no doubt but that electro-magnetic engines would be most suitable, especially for driving light machinery, such as sewing machines, &c.

J. H. L., of Ind.—The spirit obtained from grain is from that part which may be converted into starch, and for this reason starch manufacturers are exceedingly careful to prevent vinous fermentation in their vats. A considerable amount of spirit may be obtained from starch, but at present we cannot give you the exact quantity. The Postmaster ordered your paper to be stopped as uncalled for.

P. F. K., of Ga.—We do not know where you can get your old tea-trays japanned, but we will tell you how to do it yourself. First clean them thoroughly with soap and water and a little rotten stone; then dry them by wiping and exposure at the fire. Now, get some good copal varnish, mix with it some bronze powder, and apply with a brush to the denuded parts. After which set the tea-tray in a oven at a heat of 212° or 300° until the varnish is dry. Two coats will make it equal to new.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Aug. 26, 1859:—

F. S. P., of N. Y., $25; J. A. S., of Mo., $30; L. M., of Wis., $7; A. C. P., of N. Y., $30; C. & L., of N. C., $30; S. & La R., of Ind., $25; W. & W. Mfg Co., of N. Y., $525; L. W., of Mich., $5; I. N. P., of Ind., $25; L. B., of Cal., $100; C. E. R., of N. Y., $25; J. W. & H. A. G., of Pa., $30; J. S., of Maine, $30; J. B., of N. Y., $35; H. K. S., of Mass., $25; W. C. P., of Ind., $5; N. S., of Minn. Ter., $30; G. G. N., of Mass., $30; C. & C., of Pa., $30; K. & M., of Vt., $10; G. E. S., of Ill., $25; T. & J., of Pa., $25; A. P., of N. Y., $55; P. C. F., of N. Y., $25; H. P. I., of Conn., $25; I. O., of Texas, $10; I. P., of N. Y., $30; L. R. F., of Ga., $15; J. P. A., of Ga., $25; J. W. D., of Mass., $30; J. S. C., of Pa., $36; L. G. K., of N. Y., $30; C. W. W., of N. Y., $30; S. R. McD., of Del., $30; A. L. F., of N. Y., $25; J. S. L., of Pa., $25; T. P., of N. Y., $40; J. A., of N. J., $50; B. & C., of N. Y., $25.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Aug. 26, 1859:—

H. K. S., of Mass.; E. D., of La.; C. E. R., of N. Y.; L. M., of Wis.; C. L. R., of Wis.; P. C. F., of N. Y.; A. P., of N. Y.; L. R. F., of Ga.; A. L. F., of N. Y.; G. W. R. B., of La.; W. P. C., of Ind.; J. W., of S. C.; J. P. A., of Ga.; S. & La R., of Ind.; F. S. R., of N. Y.; H. P. J., of Conn.; L. E., of Cal.; I. N. P., of Ind.; G. E. S., of Ill; T. P., of N. Y.; J. S. L., of Pa.; J. A., of N. J. (two cases); B. & C., of N. Y.

History of the Scientific American and Important Information to Patentees.

We have printed a supplementary edition of the SCIENTIFIC AMERICAN, in which there is a history of its rise and progress, with illustrations of the building, externally and internally, showing the spacious rooms in which our immense patent business is conducted, and with life-like representations of the artists, engineers and specification writers at their daily labors. The same paper contains information on the many intricate points arising in patent law and practice, and comprises the best popular treatise on the subject ever published; it should be in the hands of all who are interested either in procuring, managing or using patented inventions. The legal information contained in this paper is the result of FOURTEEN YEARS' experience as patent solicitors, and it cannot be found in any other treatise on patent law. It also contains information in regard to Foreign Patents and Extensions. It is published in octavo form, sixteen pages, and mailed upon receipt of two three-cent stamps. Address MUNN & Co., publishers of the SCIENTIFIC AMERICAN, New York City.

PORTABLE RAILROAD TRACK AND METAL BAR CUTTER—For cutting medium and large sized bars without previously heating. Patented Sept. 21, 1858. A very desirable article for Machine Shops, Railroad Companies, Iron Stores, &c. Its advantages are, first, A stout boy can cut off a cold bar of iron, of any size up to four inches, to any desired exact length, in less time than would be required for heating. Second, It is portable, weighing only about 112 pounds, and can be used in any part of a shop or railroad. Third, The end cut is left smooth for centering, &c. We also manufacture a similar machine, geared and adapted to the use of power, for machine, engine shops, &c. For particulars address CRESSON & HUBBARD,
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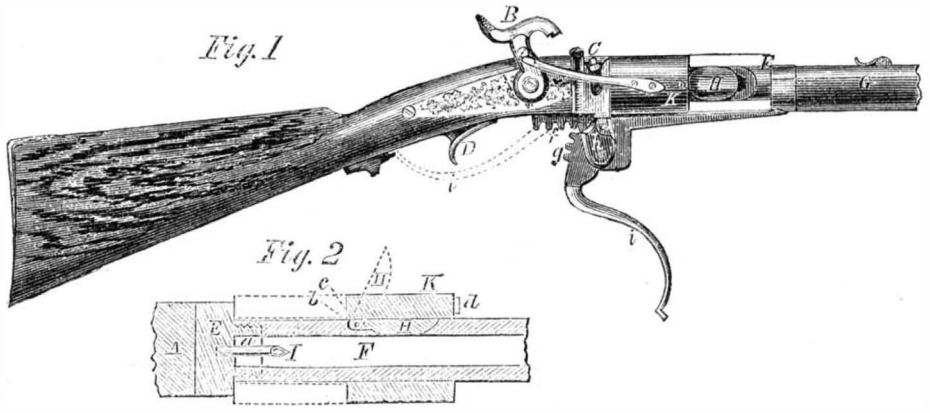
A is the gun-stock; B, the cock or hammer; C, the nipple; and D, the trigger of a carbine or other gun.

E is the breech back-piece, connected with the stock, and formed with a reduced shoulder or hollow neck, *a*, in front, on which is cut a screw-thread for the breech, F, of the barrel, G, to screw on to, or the breech and barrel formed either in distinct pieces or in one piece may be otherwise connected with the stock. The breech, F, is of a stationary character and closed construction in the rear, where the cartridge is designed to be placed, whereby increased strength is secured to resist the first violent effect of the explosion on the sides of the breech, and "blowing" or escape of the gas at that portion during ignition of the powder, is avoided by there being no hinged or opening and closing breech proper, as in other breech-loading fire-arms, for insertion of the cartridge. This stationary closed construction of the breech gives the gun the strength and lightness there of a muzzle-loading gun; and, in the avoidance of a frequently-opening and closing or working joint at that part, much objection is removed to the breech-loading arm. There is not a thorough cross-break or joint in any part of the breech or barrel to despoil it of a closed character, other than to provide a cartridge-charging lid or door in advance of the rear portion of the breech, where an opening, and that not a transverse but longitudinal one, which is less detrimental to the general strength, and especially to the part receiving the first shock of the explosion, and less liable to occasion leakage than when such opening is in a different position relatively to the cartridge of a loaded gun.



This cartridge lid may be arranged in any suitable situation circumferentially of the forward part of the breech, F, and it may be hung to open inwards or outwards. In the accompanying drawing, said lid, H, is shown secured by a joint or hinged structure, *b*, in the rear, and arranged to open outwards on the one side of the breech.

This lid or door, H, may be shaped to correspond to the base of the part of the breech it fits, and of convex form, to correspond to the outside of the breech on its exterior, with a raised back or rear end projection, *c*.

Fig. 2 of the drawing shows the door when closed, and also when open. By referring to this figure, it will readily be seen how the cartridge may be inserted through the opening made in the forward part of the breech when the lid, H, is open, and how the cartridge thus inserted may be pushed home or back to its proper place.

I is a tubular pen-pointed cartridge-pricker, arranged to project longitudinally into the chamber portion of the breech from and at the back of the latter. On pushing home the cartridge, as described, this hollow pricker readily punctures the end of the cartridge by the pressure of the latter against it, and it establishes a close channel for the loosened powder, in direct communication with he nipple, to ensure and promote ignition on the hammer exploding the cap. The formation of this tubular pricker at its forward end has its value enhanced or made more apparent by the way in which the cartridge is inserted and forced to its place, the puncturing cut of the picker being a gradual and shear one.

K is a longitudinally sliding collar or sleeve surrounding the breech. This sleeve is designed to slide over the cartridge lid, H, and serves, when slid forward, to close and lock the open projecting lid, and, on sliding said sleeve back, opens the lid by a face-end covering, *d*, to a longitudinal groove in the sleeve striking and bearing against the raised or projecting portion, *c*, of the lid in its rear.

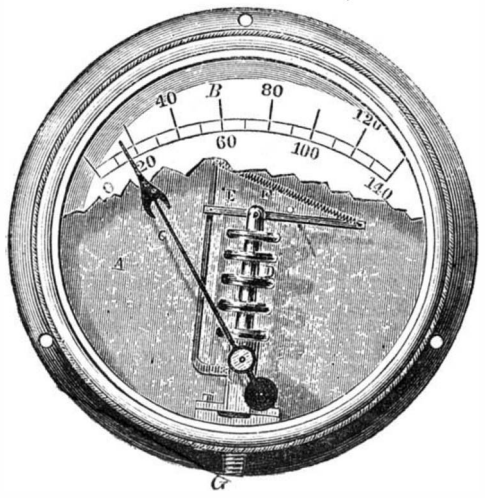
The lid, H, should be made beveled at its sides and ends to make its joint with the breech tight when closed; but, to provide against clogging by any leakage and accumulation of matter on its outside, and between it and the sleeve, the latter need not fit close all round the breech, but may have one or more relieving recesses formed in its interior.

Connected with the sleeve, K, is a rack, *f*, into which a toothed sector, *g*, meshes. This sector is hung on a fulcrum, *h*, below the stock, and has attached to or formed with it a back-curved arm or lever, *i*, that, on being turned up against the stock, urges forward the sleeve and closes the cartridge lid, and that, on being turned in a downward direction, forces back the sleeve and opens the lid. An under guard may be arranged, if desired, to protect this lever, toothed sector and sleeve.

The sleeve, K, which performs the treble function, without the aid of objectionable springs, of opening, closing, locking or embracing the cartridge lid, may be operated in the manner described by any other suitable mechanical means than those here indicated.

The inventor is Thomas E. Shull, of Lewiston, Pa. and any further information may be obtained by addressing S. A. Heath & Co., Inventors' Exchange, 37 Park-row, New York, where a gun is on exhibition. The patent is dated April 5, 1859.

BEAUMONT'S STEAM-GAGE.



The novelty of this steam-gage consists in the method in which the steam acts upon the index. A number of thin hollow cups, D, are connected together in a series, so as to form a spring, and the slightest change of pressure in the interior produces immediately a vertical elevation or depression of the series. This motion is communicated to the index finger C, by a lever and connecting bar, E, which are held back by a small spring F, the action of which is to keep the lever and connecting bar always in their proper and most sensitive position. The case, A, may be of cast iron or brass, and is provided with a gradua ed scale, B, with the pounds marked thereon. The case is connected to the pipe communicating with the boiler by a screw, G, which is hollow so that the steam enters into the interior of the spring cups D. These gages can be made to indicate from the lowest pressure to the highest, and the inventor has also patented a cheap barometer on the same principle. It is the invention of Victor Beaumont, of New York, and the patent is dated June 14, 1859. C. W. Copeland, of 122 Broadway, New York, is the general agent and he will be happy to supply the gages and any further information which may be desired.

DEATH OF AN INVENTOR.

Allan Pollock, Esq., an aged and highly esteemed citizen, died at Roxbury, yesterday, in the 93d year of his age. The deceased was by birth a Scotchman, and a man of rare inventive faculties. He was employed at Lowell by the original founders of that city, and under their auspices brought out the first calico-printing machinery used in that now-noted manufacturing city. He afterwards made thermometers and microscopes in this city, and nearly lost his eyes by the explosion of some quicksilver which he was working. A stove of his invention was quite famous before the Pierpont stove was introduced. Mr. Pollock will be remembered by the older portion of the residents of Boston as a most worthy citizen. For many years he lived at the corner of Boylston and Carver-streets. His last days were passed in Roxbury, where he died full of years and honors.—*Boston Transcript, Aug.* 24.

SPALDING'S PREPARED GLUE.—We have received several samples of prepared liquid glue, put up in small bottles, by Mr. H. C. Spalding, 30 Platt-street, this city, and have tried it in mending old furniture. It is a very convenient article for domestic use, and deserves to be kept constantly on hand in every household. It is also a convenient article for pattern-makers and inventors in constructing and repairing their models.

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